DOCUMENT RESUME

ED 142 321 PS 009 440

AUTHOR	Hall, Arden; Weiner, Samuel
TITLE	The Supply of Day Care Services in Denver and Seattle.
INSTITUTION	Stanford Research Inst., Menlo Park, Calif. Center for the Study of Welfare Policy.
SPONS AGENCY	Department of Health, Education, and Welfare, Washington, D.C.
REPORT NO	SRI-CSWP-RM-33
PUB DATE	Jun 77
CONTRACT	SRS-70-53; SRS-71-18
NOTE	177p.
EDRS PRICE	MF-$0.83 HC-$10.03 Plus Postage.
DESCRIPTORS	Costs; *Day Care Services; *Early Childhood Education; Educational Supply; *Family Day Care; Income; *Program Descriptions
IDENTIFIERS	*Colorado (Denver); *Washington (Seattle)

ABSTRACT

This study presents an analysis of the day care industry in Seattle, Washington and Denver, Colorado. The analysis includes a description of the day care structure as it existed in mid-1974, as well as an estimate and breakdown of cost functions in order to determine the custodial component of day care services. Four separate sectors of the day care industry are recognized: in-home providers, unlicensed family day care home operators, licensed family day care home providers, and child care centers. Chapter titles include: Characteristics of the Day Care Industry, of the Providers, and of the Day Care Services; Supply Constraints; Income and Costs. (Author/SB)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

STANFORD RESEARCH INSTITUTE
Menlo Park, California 94025 · U.S.A.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED142321

Center for the Study of Welfare Policy

Research Memorandum 33

June 1977

THE SUPPLY OF DAY CARE SERVICES IN DENVER AND SEATTLE

By:

ARDEN HALL
SAMUEL WEINER

SRI Project URD-8750/1190

Project Leader: R. G. Spiegelman

PS009440

The research reported herein was performed pursuant to contracts with the states of Washington and Colorado, prime contractors for the Department of Health, Education, and Welfare under contract numbers SRS-70-53 and SRS-71-18 respectively. The opinions expressed in the paper are those of the authors and should not be construed as representing the opinions or policies of the states of Washington or Colorado or any agency of the United States Government.

ACKNOWLEDGMENTS

The authors wish to express their gratitude to the following people who contributed to this report: Gail Inderfurth, Lois Blanchard, Janey Elliott, and Tony Muller of Mathematica Policy Research, who helped prepare the interviews and collect data; Christine Decker and Barbara Ferber, who monitored the survey operation; and David Grembowski, and Jarvis Rich, who provided invaluable computational assistance. Sonia Conly and Lucy Conboy of DHEW ably reviewed an earlier draft, and Robert G. Spiegelman's constant review at all stages was a valuable input. Our appreciation is also offered to many state and local representatives for their help in selecting day care providers for this study, and also for their help in structuring the interview questionnaire.

CONTENTS

ACKNOWLEDGMENTS		iii
LIST OF TABLES		vii
	SUMMARY AND CONCLUSIONS	SC-1
	Summary	SC-1
	Characteristics of the Day Care Industry	SC-1
	Supply Constraints	SC-4
	Revenues and Fees	SC-7
	Costs	SC-10
	Conclusions	SC-13
	Implications for Public Policy	SC-16
	Considerations Regarding Subsidies	SC-19
I	INTRODUCTION	I-1
	Components of the Day Care Industry	I-2
	Aspects of the Economics of Day Care	I-5
II	CHARACTERISTICS OF THE DAY CARE INDUSTRY, OF THE PROVIDERS, AND OF THE DAY CARE SERVICES	II-1
	Information from Other User Surveys	II-1
	Licensing Considerations	II-4
	Provider Characteristics	II-6
	Considerations of Quality	II-11
III	SUPPLY CONSTRAINTS	III-1
	Barriers to Entry	III-1
	Capacity Considerations	III-5
	Sick-Child Care	III-9
	Information	III-11
IV	INCOME	IV-1
	Subsidies	IV-1
	Revenue and Fees	IV-5
	Importance of Earnings in Family Income	IV-15
V	COSTS	V-1
	Descriptive Review of Costs	V-1
	Cost Functions--An Attempt to Isolate the Cost of Custodial Care	V-10

V COSTS (Continued)

Specifications of Variables V-14
Cost Equations and the Estimation of Custodial Care for In-Home and Family Day Care Home Providers V-14
Cost Equations and the Estimation of Custodial Care for Centers V-19

APPENDICES

A DAY CARE SURVEY A-1

B CLASSIFICATION OF HOURS OF CARE B-1

C TESTS OF RANDOMNESS OF RETURNED STAFF QUESTIONNAIRES C-1

D DAY CARE COSTS: PREVIOUS STUDIES D-1

E CAPITAL COSTS IN DAY CARE HOMES E-1

F SUPPLEMENTARY INFORMATION FOR THE DERIVATION OF FUNCTIONS USED IN THE ESTIMATION OF THE COST OF CUSTODIAL CARE F-1

REFERENCES R-1

TABLES

1	Percent of Day Care Provided Within the Three Main Sectors	II-3
2	Age and Race of Day Care Providers, and Race of Children	II-7
3	Selected Characteristics of Day Care Providers	II-8
4	Children Related to Child Care Provider by Race/ Ethnic Class of Provider	II-12
5	Child/Staff Ratios	II-14
6	Education of Provider	II-16
7	Percent of Child Care Time Devoted to Various Types of Child Care	II-19
8	Health Care Services Provided to Children in Day Care Centers	II-21
9	Percent of Capacity Utilized	III-7
10	Age of Children Using Day Care and Number of Children Cared For	III-10
11	Care Provided for Sick Child	III-12
12	Subsidization of Day Care Users	IV-4
13	Percent of Children in Family Day Care Homes Whose Fees Are Fully or Partially Subsidized, by Race/ Ethnic Group of Child	IV-5
14	Day Care Center Subsidies	IV-6
15	Cross Tabulation Between Revenue Per Child and Percent of Children Subsidized, Centers	IV-7
16	Gross Monthly Earnings	IV-9
17	Fees per Child Hour of Care	IV-10
18	Parameter Estimates for Gross Quarterly Earnings in Denver (Unlicensed FDCH)	IV-13
19	Parameter Estimates for Gross Quarterly Earnings in Seattle and Denver (Licensed FDCH)	IV-14
20	Predicted Gross Monthly Earnings	IV-15
21	Percent of Providers' Income Represented by Child Care Earnings	IV-16

22	Mean Costs and Revenue for Unlicensed FDCH Providers	V-2
23	Mean Costs and Revenue for Licensed FDCH Providers	V-3
24	Relationships Between Variable Cost, Children Enrolled, and Total Revenue	V-5
25	Effect of Enforcement of the Minimum Wage on Center Wage Bill	V-7
26	Current Market Value of Equipment and Vehicles	V-9
27	Combined Regression Separated by City and Provider Type	V-15
28	Values of Parameters for Custodial Care	V-16
29	Reduced City/Provider Type Regressions	V-17
30	Cost per Child for Custodial Care	V-18
31	Day Care Center Regression	V-20
32	Values of Parameters for Custodial Care	V-22
33	Cost of Custodial Care in Day Care Centers	V-23
D-1	Payment for Teachers with a Bachelor's Degree	D-4
D-2	Child Care Costs for Centers	D-6
E-1	Control Variables	E-4
E-2	Regression Coefficients for Seattle	E-5
E-3	Regression Coefficients for Denver	E-6
E-4	Means of Independent Variables	E-7
E-5	Predicted Differences	E-7
E-6	Test Results, Seattle and Denver	E-8
F-1	Combined In-Home and Family Day Care Home Regression Dependent Variable: CR	F-8

SUMMARY AND CONCLUSIONS

Summary

The purpose of this study is to present an analysis of the day care industry in Seattle and in Denver. This analysis includes a description of the day care structure as it existed in mid-1974, as well as an estimate and breakdown of cost functions in order to determine the custodial component of day care services.

Four separate sectors of the day care industry are recognized in this study: in-home (I-H) providers, unlicensed family day care home (FDCH) operators, licensed FDCH operators, and child care centers. For some purposes, these four sectors are grouped into an informal and a formal sector. The informal part consists of I-H and unlicensed FDCH operators, while the formal segment consists of licensed FDCH and center providers. Moreover, the center sector is further broken down into three different types: nonprofit private, nonprofit public, and for-profit private centers.

Characteristics of the Day Care Industry

Day Care Providers

Day care providers in the informal sectors were somewhat younger than those in the formal sectors. However, in each sector we found that the majority of the providers, regardless of age, had some previous full time job other than child care; within the formal sector, almost all providers had some previous full time work experience. There are indications that some of the providers, expecially those in the informal sectors, may be temporarily out of the regular labor force, primarily due to the desire to stay home to care for their own children or to acquire an education. Nevertheless, the majority of day care providers are probably part of the regular labor force.

The implication of this finding is that labor supply would be unlikely to constrain an expansion of day care service, unless providers are required to come from some special group, such as housewives with experience in elementary education. In that case, an expansion of the supply of day care might be limited by a shortage of that type of labor. However, the fairly low average level of educational achievement in most sectors makes that assumption unlikely, at least as it concerns the majority of providers.

We also found that the proportion of Black and Chicano providers in the informal sector in Denver was much greater than in the formal sector. The same finding is true in Seattle, except for I-H providers, where the proportion from minority groups is approximately the same as in centers. Moreover, the racial/ethnic composition of day care users in both cities was approximately the same as that of providers. However, within the center sector we found that a large percent of the public nonprofit staff and children were from minority groups, while only a small proportion of users and staff in the private for-profit centers were Black or Chicanos. Therefore, except for the profit-oriented centers, we found that there was no apparent restriction on entry into the field of day care by minority group members.

Providers and users are more likely to be related in Denver than in Seattle. We obtained information on the relationship between users and providers of day care for all but the center sector. For the licensed FDCHs, about one-fourth of the children using day care services were related to providers of those services. However, in the informal sectors, there was a much larger percentage of providers in Denver who were related to the children for whom they provided care than in Seattle: almost two-thirds of the unlicensed FDCH operators in Denver were related to the children using their services, whereas in Seattle the proportion was only one-third. Furthermore, we found that over four-fifths of the Chicano unlicensed FDCH operators in Denver provided services for related children. It appears that the more liberal subsidy policy in Denver, whereby related unlicensed providers can more

easily obtain payment for providing day care services, has resulted in a far greater use of relatives for unlicensed day care.

Considerations of Quality in Day Care

From the point of view of users, perhaps the most important consideration concerning day care services is the quality of that care. While no universally accepted standard for determining quality exists, when comparisons must be made, the ratio of children to child care staff is generally used. The view is that where there are fewer children per available staff, there is a higher quality of care being provided. (Research being undertaken by the Office of Child Development may soon shed light on this controversial issue.) We were able to obtain data to estimate the child/staff ratios, and we also obtained data for an alternative measure of quality, the self-reported ratio of educational to custodial activities.

As regards the child/staff ratio, we found that the informal sectors in both cities have lower ratios--that is, higher presumed quality of care--than was found in the formal sector. However, characteristics of the caretaker are also of importance in judging how the available staff affects quality. We found that the educational achievement, which is presumed to be positively related to the quality of care, of informal sector providers is generally lower than was found for the formal sector staff. That is, although intrasector comparisons of quality on the basis of the child/staff ratio are possible, inter-sector comparisons are not very meaningful. It is difficult to judge, therefore, on the basis of the child/staff ratios, whether the quality of care was higher or lower among the various sectors of the day care industry. Within each sector, assuming that the child/staff ratio is an acceptable criterion of quality, those providers with fewer children are offering better care. In the center sector in particular, the public centers were providing better care than the other center components in both cities, although the difference in the child/staff ratios between the public and private nonprofit centers in Denver was negligible.

The other measure of quality for which we obtained data (self-reported by the provider) was the percent of total day care time devoted by providers to educational-developmental activities, relative to the time spent on purely custodial services.* In Seattle, the informal sector providers said that about 10% of their time spent caring for children for pay was devoted to educational-developmental care. The licensed FDCH providers in Seattle, along with all sectors other than centers in Denver, said that about 20% of their time was devoted to the higher quality of care. In centers, about 30% of the time was spent on educational-developmental care, with public center staff claiming that up to 45% of their time was devoted to the higher quality of care.

Although we have presented our findings on some variables thought to influence the quality of care, we hesitate to draw firm conclusions from the results. The definition and measurement of the quality of day care have not been formulated objectively enough by educators to allow economists to make judgments about the adequacy of existing day care.

Supply Constraints

Our study of the supply of day care focused on two major issues. First, we asked whether there was excess supply or demand for day care services, i.e., whether or not the day care market was in equilibrium; and second, we asked what could be said with regard to the price elasticity of supply--that is, could we determine the relationship existing between changes in supply and changes in the price of day care services?

Although equilibrium conditions are difficult to determine from a static view of the market at one point in time, a review of the capacity

---

*As a measure of quality of care this ratio is only a reasonable approximation for at least two reasons: first, the questionnaire allowed respondents considerable freedom in categorizing their activities, which must have lead to some inconsistencies in the data; second, there is some evidence that activities classed as educational-developmental can be harmful to the child. (See, e.g., William J. Meyer [13].)

utilization of providers and of waiting lists for users in the day care market can provide some information about the state of the market at the time of the survey. Examination of that data leads us to believe that the markets for day care in Seattle and Denver were approximately in equilibrium at the time the interview was conducted. However, there appears to be substantial friction in the clearing of the market. For example, within the center sector we found that almost 60% of all centers in both cities had waiting lists, with almost three-fourths of the public nonprofit centers stating that they had a waiting list; and at the same time we found that the average level of capacity utilization for Seattle centers was 85%, with the public centers utilizing only 78% of their capacity. In Denver the utilization rate was 95% for both the total as well as for public centers.

That unused day care services and waiting lists exist simultaneously may indicate some frictions in the day care market; which may have a variety of causes. Day care service is not easily standardized, so demanders must search for a supplier who fits their needs. Differences in the type of care, as well as in the hours of available care, contribute to the time needed to find desired day care. Special needs may also make a match between child and provider more difficult. We found that care was more difficult to find for very young children and for children with any but the most routine illness. It is a commonly heard complaint that not enough day care capacity is available for toddlers--children under the age of two. However, we found that a substantial proportion of the children cared for in licensed and unlicensed FDCHs in both cities, as well as in public centers in Seattle, are toddlers. If day care users are trying to get toddlers into the other segment of the day care market, the complaint may have some validity, as only a small percentage of the children cared for in these other segments are less than two years of age. Although a large percentage of the informal sector providers will take care of children with a minor illness (e.g., a cold), the percentage drops sharply for licensed FDCH providers; and the percentage of centers that offer such care is negligible. Yet another possible reason for friction in the day care market is that information

about available suppliers was not widely used. Although both cities have free referral services, we found that only 10% to 25% of all children were enrolled through the use of these services. Most of the other users learn of the available service through friends, neighbors, or relatives. These, then, are some of the causes for the simultaneous existence of underutilization of capacity and excess demand in the market as a whole.

Information on the reaction of supply to changing prices was more difficult to obtain than that about the current state of the market. The available information related to possible constraints on supply rather than to the actual change in aggregate supply that might result from an increase in price. As has already been mentioned, the supply of labor seems unlikely to be an absolute constraint on the supply of day care. Other inputs, such as buildings or equipment, are also not likely to constrain the expansion of day care.

However, there are barriers to entry, in the form of licensing and zoning requirements, for providers in the formal sector of the day care industry, which could potentially constrain the supply of day care. The licensing procedure, although it takes some time, does not seem to be a major barrier: the majority of providers waited less than two months to obtain their licenses and few family day care homes spent more than $100 complying with licensing requirements. However, there is some indication that the cost of compliance, especially as it concerns the new Title XX child/staff standards, may present a significant financial burden for the private for-profit centers,* if enforced. Zoning restrictions may also present something of a barrier to entry for centers. Approximately one-third of the centers in both cities and a smaller proportion of family day care homes had to obtain zoning variances in order to provide day care services. These licensing and zoning requirements did contribute

---

*See Samuel Weiner, "The Cost of Compliance to Federal Day Care Standards in Seattle and Denver," SRI Research Memorandum, June 1977.

noticeably to the cost of entry into the day care market. However, these are costs under control of the local authorities. Regulations could be simplified and procedures streamlined if the decision were made to increase the availability of day care. For example, in Denver there are a number of different agencies involved in the licensing process, including health, sanitation, zoning, building, and fire. These somewhat overlapping jurisdictions delay the licensing procedure and most certainly impose an additional, if only psychic, cost to the potential entrant into the day care market.

Revenues and Fees

This deals with the financial environment of day care providers. The issues dealt with in that area are primarily concerned with subsidies, fees, and revenues.

Concerning subsidies, we found that in Seattle very few of the informal sector children were fully subsidized, somewhat less than 10%; in Denver, between one-fifth and one-third of the users of informal care were fully subsidized. (We found that Denver was more liberal than Seattle in allowing subsidy payments for I-H and unlicensed FDCH vendors. In general there appeared to be less governmental interference or pressure on the day care industry in Denver.) In the Seattle centers, about one-fourth of the enrolled children were fully subsidized; however, the public component of the center sector showed a much higher percentage of their children being subsidized, almost 75%. In the Denver centers, a very small percentage--less than 5% overall--of the enrolled children were fully subsidized. Again, the public centers, with almost 45% of their children fully subsidized, were an exception.

An important finding for centers was that the larger the percentage of children being subsidized, the greater the gross revenue per child. Because of the nature of the data collected, a similar comparison for the other sectors was not undertaken. For centers, however, this finding

indicates the possibility of differential pricing according to subsidy status.* The data also suggest the possibility that revenue from subsidized children is a steadier and more reliable source of income. Moreover, the payment for subsidized children relative to nonsubsidized users is more likely to be made even if the child is absent for a short period. This could also lead to higher average revenue from subsidized children.

Concerning fees, we found that on the average the fees per child range between about 45¢ and 60¢/hr in all sectors, except for the private nonprofit centers in Denver, where the average fee charged falls to 33¢/hr. However, we also found a very large variance in the average hourly fees paid. Although the variance was large for all sectors, it was especially pronounced in some: in Seattle, for example, the maximum fees were more than three times greater than the average for I-H providers and for every type of center provider, whereas FDCH operators showed a much smaller difference between the average and the maximum fees. In Denver, on the other hand, the variation was very large for all sectors, with the exception of the public and private nonprofit centers.

Revenue consists of the fees and subsidy payments received. Gross monthly revenue per child is fairly low for the informal providers in both cities, being about $20 to $30; it rises to $42/child in both cities for the licensed FDCH operators; and it again doubles for centers, with Denver showing a substantially higher average gross monthly earnings than Seattle. In both cities the public centers had the highest average gross monthly revenue. The variation between sectors was far less marked with regard to the maximum gross monthly revenue per child. We found,

---

*One reviewer suggested that such a positive relationship could be a reflection of higher wage bills at public centers, which have a much larger proportion of their users subsidized. This seems to be as reasonable a hypothesis as the one suggested above.

overall, that approximately 90% of all sector providers had gross monthly revenue per child that was less than $100, with the exception of the public centers. In that component of the center sector, less than one-fourth of the providers grossed under $100/child/month.

We also wanted to determine whether earnings could be predicted from data collected in the survey. Furthermore, we were interested in the racial/ethnic earnings differences that might be found in those predictions. In order to accomplish this, we regressed gross earnings per month per provider against seventeen independent variables to obtain an estimated regression equation for predicting earnings. This was done for unlicensed FDCHs in Denver and licensed FDCHs in both Seattle and Denver.* The predicted values using the mean values of the independent variables in the estimated regressions are somewhat lower than earnings obtained directly from the survey data; however, the predicted values are all within one standard error of the survey data earnings. We also found that the predicted earnings for Blacks in Seattle are somewhat higher than for Whites, but predicted earnings for Blacks in Denver are lower than similar values for Whites or Chicanos for both licensed and unlicensed FDCH operators. This result is difficult to explain but is consistent with the effect of race in the estimated cost functions, as reported in Part V of this study.

Finally, we also have data supporting the view that day care earnings for I-H as well as licensed and unlicensed FDCH operators are generally a second source of family income. For those groups, in both cities, the majority said their day care earnings were their only source of personal incomes; however, only a very small proportion said that those earnings contributed at least half of their total family income. It appears that most of those day care providers are women who are classified as secondary workers but are part of the regular labor force. Others have preteenaged children, and in the absence of an earning

*The data for I-H and center providers in both cities, and unlicensed FDCH providers in Seattle, was not suitable for estimating a regression model.

potential within an environment where they can provide care for their own children, they would be in the labor market on at best a part-time basis, either in hours per week or weeks worked per year.

Costs

Descriptive

This is the last area for descriptive analysis that is covered by data from our survey. Here we present a descriptive analysis of the actual costs of the services provided by those interviewed. The same data base is used to derive a cost relationship in which the custodial component can be isolated. A summary of that analysis is presented below.

In 1968, the Children's Bureau of HEW presented costs for various levels of day care.* If we adjust those costs for 1974 prices, and if we assume that gross revenue equals costs, we can compare the Children's Bureau standards with our survey data. The costs given by the Children's Bureau for alternative levels of care,† according to the quality of care provided, were:

Minimum‡ level of care	$136/child/month
Acceptable level of care	$204/child/month
Desirable§ level of care	$254/child/month

Our survey data shows that only public centers in either city met the minimum standard.

---

*Although the Bureau was an advocacy agency their standards can be used as a yardstick against which other costs can be measured.

†These are costs estimated for centers; the equivalent costs for family day care homes are $156 (minimum), $222 (acceptable), and $260 (desirable).

‡This level of care approximates custodial care.

§This level of care would involve a high level of educational-developmental care.

The costs that we estimated from our data were far lower than those suggested above for a minimum level of care. The average monthly cost for unlicensed FDCH operators, excluding imputed salaries, is about $35 in both Seattle and Denver. Comparable costs for licensed FDCH operators are substantially higher in both cities, $83 in Denver and $112 in Seattle.

We also derived costs for a level of care even lower than our survey data estimates. If our determination of an adequate level of custodial care is comparable to the Children's Bureau's minimum level of care, then costs for that type of care in Seattle and Denver are far below those suggested by the Bureau. On the other hand, the minimum level of care proposed by HEW may include noncustodial elements, or our measure of adequate custodial care may be considered subminimal by the Children's Bureau. If the Children's Bureau figures for minimum care are a true reflection of adequate custodial care, we must conclude that the majority of the Seattle and Denver day care operators do not provide it.

In the center sector, we were able to derive estimates for the monthly variable cost* per child. In Seattle, it averaged $95 and in Denver it averaged $107. Within the center sector the ranges for monthly variable cost per child were $61-157 in Seattle and $68-$160 in Denver. In almost all cases, the variable cost was between 85% and 100% of total revenue.

The Cost of Custodial Care

Before a rational decision can be made regarding government subsidization of day care, cost and cost determinants must be known. Part V provides this information for Seattle and Denver. Cost functions are presented that provide estimates of the cost of custodial day care in the two cities. While they provide the information required by the

*Including salaries and wages, insurance, rent, all utilities, janitorial service, nondurable supplies, advertisement, food, and cost of leased equipment.

policy maker, they do not represent a complete description of cost relationships in day care. The limitation on these results is that variations in quality are not brought explicitly into the models. Because of the diversity of opinion regarding the nature of quality for day care services,* and also the necessity of taking some account of differences in quality, we chose to estimate costs for one particular level of care that we felt could be adequately defined: custodial care--that is, day care that approximates the care provided by a family† but does not include services aimed specifically at child development.‡

Cost functions were estimated for in-home providers, family day care homes, and day care centers in Seattle and Denver. We took advantage of the similarities between cities and between some types of providers to pool the data and obtain more accurate estimates. However, within these pooled models, important variables were allowed to vary across cities and provider types. Values of the explanatory variables were chosen representing a custodial level of care, and these were substituted into the estimated models to produce estimates of the cost of day care for each city and provider type. For both cities it was found that care by in-home providers was least expensive and that by family day care homes was most expensive. Estimated charges per child for a 40-hour week of care ranged from $10.98 to $22.56 in Seattle and from $7.37 to $17.22 in Denver. For in-home providers, the charge was calculated per family rather than per child. For a family of six children, the same number of children per provider used for the estimates for the other types of day

---

*See discussion in Part II.

†We do not wish to imply any value judgment on the quality of care provided by parents. However, such care could be described as care given by persons not usually specially educated for the task. We borrow (without necessarily endorsing) from educators the ideas that specific education in child care is desirable in day care providers and that formal developmental programs are beneficial additions to day care programs. The reader should bear these assumptions in mind in assessing our findings.

‡See Appendix F for a discussion of the variables used as indicators of quality in the estimated cost functions.

care, the minimum charge was $45.78 in Seattle and $29.58 in Denver (or $7.63 per child in Seattle and $4.93 per child in Denver).

In producing these results, it was necessary to make some assumptions about the capital used in the production of day care services in family day care homes. Any capital used by in-home providers presumably belongs to the parents of the child and so is not an element of cost; on the other hand, for centers, capital could be brought explicitly into the cost relationship. But FDCHs are homes as well as day care providers, so pieces of their capital cannot be identified as specifically devoted to day care. We could not use capital in the cost relationship for FDCHs, but an analysis was done to see if a part of the capital found in these homes could be related to child care. Three measures of capital for FDCHs were compared with the same measures for a control group of similar families who did not provide day care, drawn from the control populations for the Seattle and Denver Income Maintenance Experiments. The only difference discovered was in the number of rooms in the home. FDCHs were found to have significantly more rooms than similar homes which did not provide child care. The difference averaged about one-and-three-quarter rooms in Seattle and one room in Denver. While too little is known to assign a dollar value to this difference, it does indicate that there are capital costs in the operation of family day care homes.

Conclusions

One conclusion we can deduce from the data reviewed is that the simple distinction between formal and informal day care, based on whether the provider is licensed, is only partially supported by the data. It is not fully supported in the sense that a comparison of the averages for the different series examined does not show a clear similarity between I-H and unlicensed FDCH providers on the one hand, and licensed FDCH and center providers on the other, for most of the series reviewed. In some cases we do find these similarities, in others not. In fact, in some cases I-H and center data are similar, while licensed

and unlicensed FDCH data follow a consistent pattern, and the two sets of data are very dissimilar.

We found that in the informal sector, there was generally a larger proportion of older and younger providers than was found in the formal sector. However, the proportions were similar in the for-profit centers to those found in the unlicensed FDCH sector. There was also a fairly consistent, if small, difference found in the mean years of schooling completed between the formal and informal groups, with the latter having a lower mean value. Furthermore, it appears that providers in the formal sector worked in their sector a longer period of time.

Looking at the racial/ethnic composition of both the providers and the children, we find little consistency in the formal/informal-care dichotomy. In general, the percentage of minority group members who are providers in the various sectors corresponds to the percentage of children who were minority group members. However, there was no clear distinction between licensed and unlicensed providers. It appears that providers and children in unlicensed FDCH facilities were more likely to be minority group members; except for the Seattle staff members, the same held for public centers. We also found that more minority children (Black and Chicano) use the public nonprofit centers. This is especially true in Seattle, where over two-thirds of the currently enrolled children are Black. Since the public centers tend to be in a model city or other low-income areas, this is not at all surprising.

When we look at the proportions of children cared for who were under two years of age, we find a similarity between I-H and center providers, as well as a similarity between the licensed and unlicensed FDCHs. This relationship was not found in any of the other series.

In general, the percentage of hours worked devoted to educational-developmental care followed the formal-informal distinction, with the latter group generally spending substantially less of its time on the higher quality of care. The same was true for the series showing the proportion of facilities that allowed sick children to stay during their normal period of care. And the data on gross monthly earnings per

currently enrolled child showed a clear distinction between licensed and unlicensed providers.

Overall, there appears to be a reasonable basis for the assertion that day care can be broken into a formal and an informal group, based on whether the facility is licensed. The other main conclusion is that there appears to be a significant difference between the two cities in many of the series discussed in this part of the study. In other words, the day care industry in Seattle is not the same as the day care industry in Denver for much of the data reviewed.

Concerning providers, there appears to be a higher proportion of older and younger providers in Seattle than in Denver, except for centers, where the opposite is true to a small extent. We also found that in Denver providers were generally slightly less educated in terms of years of schooling completed. Furthermore, in Denver a significantly larger proportion of the providers, as well as of the children, were either Black or Chicano.

On the other hand, gross monthly earnings per enrolled child, and hourly fees per currently enrolled child, was quite similar in the four individual sectors. However, there was a substantial difference in gross monthly earnings for I-H providers in Seattle and Denver, and for hourly fees for unlicensed FDCHs.

In the informal sector in Denver, there were substantially larger numbers of related children provided day care by I-H and unlicensed FDCH providers than in Seattle, and far more of the children were fully subsidized. In the formal sector in Seattle, there was a large percentage of children whose care was fully subsidized.

In sum, there appears to be a reasonable distinction between a formal and an informal sector in the day care industry in Seattle and in Denver. There also appears to be a real difference in the structure of the day care industry between those cities. However, there were enough exceptions found to justify the view that these conclusions should not be considered too firm.

Implications for Public Policy

Few systematic studies of day care providers have been done, while both interest in the area and government intervention have increased. For these reasons it seems worthwhile to summarize the implications of this study for day care policy. It must be kept in mind that the findings discussed below and the conclusions drawn apply only to Seattle and Denver, and should not be generalized uncritically beyond those two cities.

1. Is the day care market competitive?

We found the day care markets in Seattle to be generally competitive. Prices did seem to be influenced, in the formal sector, by the level of indirect subsidy, but that is a result of the fact that subsidies to parents are earmarked for day care. If a provider cut her prices, the subsidy would be reduced for the children under her care, and she would not have improved her competitive position. This does not necessarily imply that the day care market was not competitive. Providers were free to adjust the quality of care in response to changes in the subsidy, and this mechanism, in the absence of some other constraint, would assure competition in the market. No other constraint, such as entry barriers, was found. We also found some evidence, discussed below, that direct subsidies do not result in equivalent reductions in charges. However, these subsidies may also have been spent to improve service, so this is not conclusive evidence of market power. Because no contrary evidence was found, we conclude that the day care markets in the two cities are generally competitive.

2. Are there barriers to entry in the day care market?

We found some barriers to entry into the day care market, but they were not substantial. Centers, and perhaps family day care homes, require capital investment, but the amount required is probably less than that required of most small businesses. There are also licensing and zoning requirements for formal sector providers, but the requirements are not particularly onerous. Complying with the licensing

requirements necessitates a moderate increase in capital investment. Also, certification of compliance with the licensing and zoning requirements can delay the opening of a center or family day care home, but almost all the providers in our surveys had completed the process in less than two months.

Our survey also found little evidence that entry into the market was more difficult for minorities. For the market as a whole, the racial composition of providers matched that of the children. Within some sectors of the market, we found more variation, but not enough to provide clear evidence of any pattern of discrimination.

3. Is regulation successful?

Regulation of the day care centers in both cities seemed moderately successful. Some family day care homes in both cities were unlicensed and therefore unregulated. There were fewer unlicensed homes in Seattle than in Denver, because a greater effort was made by the licensing authorities in Seattle. But, in either city, it seemed possible for someone to take a few children into her home for care with little chance that they would be noticed by the authorities.

The regulations in force at the time of our interview were straightforward and relatively easy to enforce, and some of them were enforced by other agencies, such as the fire departments. Greater effort would be required to enforce more comprehensive regulations, and some problems might be experienced if that were undertaken.

4. Would additional regulations raise costs substantially?

Using the data collected in Seattle and Denver, we made estimates of the costs of compliance with the federal day care standards, including the Title XX Ammendments that were partially implemented on October 1, 1975 (see Weiner [26]).* We found that there were a significant

*Imposition of a more stringent child/staff standard for children under three, which is part of the Title XX Ammendments, has been postponed through at least September 30, 1977.

number of licensed day care operators who were not in compliance with existing and proposed federal standards. Especially heavy costs would have to be incurred by the private for-profit centers not in compliance. On the average, however, the increases in the number of family day care homes or staffs of day care centers, upon which cost is heavily dependent, are significant, but not overwhelming.

5. Are direct subsidies an efficient means of supporting day care?

The evidence from our survey is especially equivocal on this point, because our information on direct subsidies is from 1973, while our cost data are from 1974. However, if it can be assumed that subsidy levels remained relatively fixed for the two years, then the survey indicates that direct subsidies are not an efficient means of reducing costs to users of day care, since in the sectors receiving direct subsidies, little reduction was seen in the charges to users. While this evidence argues against the use of direct subsidies to lower user charges, it is not necessarily evidence against the use of such subsidies. It may be that the direct subsidies were spent to upgrade the quality of the service provided and did not benefit the provider at all. However, the same result could be obtained by indirect subsidies to users, combined with greater regulation. Such a policy would give more control to parents, and so would seem to be preferable.

6. Can costs be estimated for a given level of care?

For a program of indirect subsidies to be efficient, the agency administering the program must be able to set a subsidy level that would just cover costs for the level of care desired. The methodology used in Part V provides a way to estimate this cost. In order to use this method, the level of care must be defined in quantitative terms, and the level of care desired should already be provided by some day care operators. If these two requirements are met, a study modeled on the one reported in Part V should provide sufficient information for the administering agency to set a reasonable subsidy level.

Considerations Regarding Subsidies

Aside from the six points discussed above, there are several issues concerned with the subsidy (revenue) side of public policy that arose from our analysis of the survey data. One of the critical issues is whether the subsidy should promote the services deemed to be desirable by the subsidizing agency, or some other nonuser group, or whether the subsidy should instead promote use of the service preferred by its user. For example, if care by members of the extended family is preferred, subsidy policy can promote such care by allowing payment to relatives, especially for in-home care. In Denver, where public agencies were more likely to allow such subsidy payments, we found a far larger percentage using relatives as I-H providers. If subsidy payments were not allowed for relatives, the modal choice would probably be affected. (See [11], pp. 47-50; although the issues raised concern the demand side, they were included here because of their relevance to other issues on the supply side.)

Another issue is the extent to which subsidy policy should promote the provision of special needs, such as sick child care or care during odd hours. The costs of these special services are generally higher than those for the usual day care service, and the subsidy policy will, in effect, determine the availability of these special services.

Finally, it appears that day care providers are partially subsidizing users through the low average earnings they receive relative to their education and previous work experience.* Enforcement of the minimum wage, especially for noncenter providers, would have serious implications for the fees, and therefore for subsidy requirements.

*This is true mainly for I-H and FDCH providers.

I INTRODUCTION

The availability of child care services for working parents is a critical issue for public policy. It is critical for labor force participation decisions, especially for mothers; and it is of equal importance to federal, state, and local governments because of the costs implied. In order to have a better understanding of this issue, a study of the demand for day care was undertaken [11]. That study emphasized the effects of child care programs on modal choice. As a complement to that study, the present report was designed to examine the several modes of day care services offered in Seattle and Denver.

In the study of demand, it was hypothesized that the day care industry could be divided into a formal and an informal sector. This division was based on whether the vendor was licensed; and the reason underlying this distinction was that licensed vendors differed in their basic economic structure and motivation from the unlicensed day care operators.

Analyzing the day care industry in terms of a formal and an informal sector is one possible approach. An alternative is to view day care as composed of four major components: in-home (I-H) care, unlicensed family day care homes (UFDCH), licensed family day care homes (LFDCH), and centers (C), with the first two components constituting the informal and the last two the formal sectors. The analysis in this study will be based largely on the four separate components, although, where it is relevant, the formal-informal dichotomy will be used. Moreover, a breakdown of the center sector, according to proprietary type, will also be used. Before proceeding with the analysis, a brief descriptive statement concerning the four components of the day care industry will be presented.

Components of the Day Care Industry

In-home child care vendors provide regular child care for pay in the user's home. This group comes closest to the popular image of the baby sitter. They tend to be younger, work fewer hours per week taking care of children for pay, and they tend to move in and out of the day care field with greater frequency than do day care providers in other sectors. In general, the in-home sector consists of a large number of highly mobile, atomistic providers. Our description of this sector is based on 25 I-H providers surveyed in Seattle and 20 in Denver.

Family day care home (FDCH) caretakers, whether unlicensed or licensed, provide regular paid child care in the caretaker's own home. Child care is usually for less than 24 hours during any one day; however, a FDCH operator can sometimes take care of children during the entire day. We include in this sector all care given for payment in cash or in kind, but do not include cooperative arrangements. Cooperative FDCHs, unless they are communal types, are usually the weekend or stray evening variety. This does not mean that cooperative child care arrangements are not in some instances, or may not be more generally in the future, a viable alternative. But as an element of the current day care industry it appears to have little relevance. Our description of the unlicensed and licensed FDCH sectors is based on interviews with 214 licensed FDCHs in Seattle and 167 in Denver, as well as on 27 unlicensed FDCHs in Seattle and 104 in Denver.

From a very intensive investigation of FDCH facilities in Massachusetts, Professor Richard R. Rowe and his associates were able to construct a typical day for an FDCH operator. He describes that day as follows:

> "A typical morning starts at 7:30 when Billy and Todd, ages two and four years, are dropped off at Mrs. Rosewater's house on Mother's way to work: one-half hour later, three-year-old Sally and five-year-old Mike and Amy arrive. Each child enters to a breakfast of juice, hot cereal, and milk. While Mrs. Rosewater does the dishes (assisted by the older children), the others wander around the kitchen, winding up in a small room Mrs. Rosewater has arranged for a children's playroom. Sally busily builds with a Lego set; Billy and Todd half-heartedly begin to play fisherman.

"Throughout the day, Mrs. Rosewater watches over and plays with the children, soothing a bumped feeling, directing a child into a game or activity, arbitrating a minor dispute over the TV. While caring for the children, Mrs. Rosewater cleans house, receives a neighbor over to chat, talks on the phone with a variety of friends, weeds the garden, and continually cleans, feeds and ministers to a changing assortment of active, messy, cheery, crying young children. The work is strenuous, sometimes boring, often uneventful. Aside from talking to her neighbor and several friends, Mrs. Rosewater spends little time during the day with other grownups. When in need, she calls her aunt, a woman who successfully raised two families.

"At 4:30 Billy's and Todd's dad stops by, talks briefly with Mrs. Rosewater about the weather and the day and takes the boys home. An hour later Sally's and Amy's mothers pick up their children. And finally, at 6:00, Mike's mom, late again and apologetic, comes to get her son" [17].

This synoptic overview is in many respects supported by the data we collected in Seattle and Denver. Unfortunately, it leaves out too much to be of importance to us in describing the supply characteristics of the FDCH sector of the day care industry.

From a purely legalistic point of view, there should be no unlicensed FDCHs as a separate group. What this view would imply is that there are only legal and illegal FDCH operations, and that aside from the legality of the operation, there is no significant difference between the two in terms of what is offered for sale. One of the important comparisons will be between licensed and unlicensed FDCHs, to determine the differences, if any, between these sectors. Our a priori view is that licensing imposes a degree of uniformity and increases stability in licensed facilities. Moreover, the structure of the licensing process may promote a more businesslike attitude on the part of proprietors of licensed facilities.

The last component in our survey was day care centers. We attempted to survey the entire population of day care centers in Seattle and Denver. Of the centers found within the limits of these cities, we obtained interview data from 67 out of 76 in Seattle and 47 out of 50 in Denver.*

*See Appendix A for more detail regarding the actual survey.

This component of the day care industry is the most structured, in terms of child care activities, and probably the most likely to be operated as a business activity. Although it is the least important of the four major components of the child care industry, in terms of the number of child care demanders using the service, it is usually thought of, at least by child care professionals, as the epitome of a child care institution. Formally, it is usually defined in terms of the number of children for whom they are licensed to care. Usually, centers can care for seven or more children, although there is a gray area where both centers and FDCHs can have 7 to 11 children. For our purposes, a center was simply defined as a child care facility licensed as a day care center.

Unlike the other sectors, centers can be broken down by type of proprietorship: profit and nonprofit, private and public. Of the 67 centers surveyed in Seattle, 21 were private profit-making operations, 35 were private nonprofit, and the other 11 were public nonprofit facilities. In Denver, the 47 centers were broken down as follows: 17 private for-profit, 13 private nonprofit, and 17 public nonprofit. A far greater percentage of the centers in Seattle are private nonprofit than in Denver. This is related to the fire standard changes for Denver mentioned below, and their effect on private nonprofit centers. Our descriptive analysis of the center sector will look at characteristics not only by city, but also by proprietor type within each city.

Some of the center data came from staff members. A separate staff supplement was given to each staff member with instructions to fill in the required answers and return the completed form to the center director. Although several follow-up procedures were initiated, the response rate for staff member supplements was disappointing.* Of 372 volunteer workers, only 33 (8.9%) returned completed forms. Fortunately, the response rate was much better for regularly paid staff. Of 1,128 regular staff in both cities, 612 (54.3%) returned forms. We ran a series of chi square tests on a cross tabulation of the frequencies of several variables against the

*In both cities, 29 centers (25.4% of the total) failed to return staff questionnaires.

proportion of all regular staff members who returned their questionnaire. In Seattle, none of the differences in the distributions were significant at the 5% level or better, while in Denver we found one significant difference for the total number of children currently enrolled. What we found in that instance was that centers with a smaller number of children enrolled were more likely to have over 25% of their total staff members return completed forms. The frequencies and chi square tests for all questions used are given in Appendix B.

On the basis of that appendix, it does not appear that there is any bias introduced in the data by considering staff members who returned their questionnaire to be representative of all regular staff members.

Aspects of the Economics of Day Care

Although we can, in many ways, view day care as an industry, it has some very unique properties. These peculiarities make it necessary to qualify statements with regard to adjustments that might be expected, in general, from some change in market conditions. One important consideration is that providers, especially in-home and FDCH, but also center staff, often care for their own children, or children of close relatives, at the same time that they provide paid care for nonrelated children. This means that operators are providing a joint product, consisting of paid care for nonrelatives and unpaid care for their own children. There is clearly some value to be attributed to the care provided for their own children. Since no money is exchanged, this value is often ignored. However, the total revenue of such providers should be adjusted to take account of the nonmonetized value of services provided to their children. If that were done, we could easily imagine a long-run adjustment where many providers were not covering (monetized) marginal costs.

The idea of joint products has another dimension--the fact that child care services consist of both custodial and educational-developmental components, provided at the same time. In any market adjustment process, we would have to break down the relationship between costs and the quantity of output provided into those two components of child care. Over

the long run, adjustments to changes in price may be quite different for providers whose cost functions are heavily weighted with an educational-developmental component.

There is no unique formal theoretical model that we can offer for understanding the economics of the day care industry. What we can do is present a brief listing of the economic issues that motivated this study.

The most important issue was determining the short- and long-run price elasticity of supply. This involves obtaining reliable estimates of the cost functions for day care services. Without them there is much less that we can say, analytically, about the supply side of the day care industry. However, with such cost functions, we can determine how supply will respond to price changes. Similarly, with well-defined cost functions estimated, we could look into the issue of scale economies for day care services.

In order to obtain these cost functions, we would have to determine all costs of production. This includes not only the current labor or equipment and supply costs, but also properly apportioned capital costs. It also means that the imputed monetary value of donated time or supplies and equipment would be required. This is especially relevant for FDCH operators, who often perform market and nonmarket activities at the same time. That is, while they care for their own children, for which no client money payment is made, they also provide paid child care for other children in their home. This creates a serious problem regarding the valuation of both market and nonmarket activities, where, as was pointed out previously, there are joint products involved. Since labor is the primary cost in all day care operations, the manner in which the market wage imputation problem is handled will have an important effect on the perceived economic viability of day care operations, especially noncenter operations. It may be true that FDCH providers subsidize buyers of their service; however, it might also be true that an incorrect valuation of the services provided their own children means we have failed to add an indirect benefit to the wages received.

Another aspect of imputed costs concerns the voluntary services supplied, especially for centers, as well as the use of their own home for FDCH operators. In general, the value of volunteer services is simply the predicted earnings that could be obtained by that individual if the time were spent in paid market activities. However, if the volunteer's child is enrolled in the center, as is often the case, an adjustment to the market wage will be needed to subtract the value of free child care time.

Along with estimating such costs, we must also face the issue of what appropriate measure of output should be used. This is related to the activity mix provided the children. Whatever the specific activities, what is needed is a dichotomy of all activities into two major components: custodial and educational-developmental. What we look for here is quality of service being provided. We need to know the extent of variation in quality within each sector of the day care industry. Furthermore, the variation may refer not only to the custodial versus educational-developmental dichotomy, but also to lack of custodial care. The latter appears mainly as a general risk element correlated positively with the number of children being cared for per custodian.

Another set of problems that must be analyzed are entry barriers and the utilization of capacity within each sector of the industry. Capacity here usually refers to the licensed upper limit on the number of children who can be cared for. However, it also depends on the number of staff present and the required child/staff ratios. Furthermore, the issue of what constitutes capacity in a day care facility is tied into the question of determining what we mean by the quality of service. A lower child/staff ratio may be a reflection of quality differences rather than capacity utilization. The issue of entry barriers is related to licensing requirements, zoning restrictions, and capital needs.

Pricing policy is yet another important issue in the economics of the day care industry. It includes not only the fee charged per unit of service offered, but also the quality of services provided. It would also be useful to look into prices charged for special services, such as odd hours or weekends. Related to the issue of prices is the question

of the subsidy paid. Furthermore, an adequate review of pricing practices would give us some insight into the extent of price competition in the day care industry.

These are not the only theoretical considerations in the economics of day care that might be relevant, but they appear to be the most obviously important aspects. In this study we have addressed some of these issues, and, using the data collected in our survey, have been able to suggest how relevant they were in Seattle and Denver (see Parts II through V). However, much yet remains to be done.

II CHARACTERISTICS OF THE DAY CARE INDUSTRY, OF THE PROVIDERS, AND OF THE DAY CARE SERVICES

Information from Other User Surveys

Several national and regional surveys of day care users have been undertaken within the past decade [1,12,17,18,21,24,27]. Most of these have concentrated on the demand side of the day care industry. Perhaps the most widely quoted, insofar as day care user characteristics are concerned, are the Low and Spindler [12] and the Ruderman [18] studies.

Ruderman takes a sample of working mothers and seeks to determine the arrangements for child care. She finds that children of working mothers are taken care of in the following seven ways: child takes care of itself (7%), mother takes care of child while working (3%), father takes care of the child (23%), an older sibling takes care of child (12%), child is cared for in home of user by other than parent or sibling (28%), child is cared for in the home of child care provider (23%), child is cared for in center, nursery school, or recreation center (4%). The first five categories consist of various forms of care provided within the child's home, whereas the last two are what is usually termed family day care home and center care. What stands out here is the preponderance of care for children of working mothers provided by some relative or by the child itself. Similar results were found in the Westinghouse-Westat survey [27]. In both surveys, almost three-fourths of child care for working mothers was provided by relatives or by self care.

In most discussions of day care as a business operation, the first four types of care listed above are generally not taken into account. Although these forms of child care make up almost half of all care provided to the children of working mothers, and can be substituted for the remaining three forms of child care, researchers in the day care field consider the first four types of care as within-family transfers.

Child care, especially when it is viewed as a business transaction, is concerned with paid-for care (in money or in kind) provided in the home of the user, in the home of the provider, or in a specially designated structure devoted to child care (although the structure may, at other times, be used for non child care activities). These three sources of care define what we know as in-home, family day care home, and center child care.

In the surveys listed above, it is clear that the bulk of day care users use informal care, whether in their own home or in that of another. Every survey in which the distinction has been employed has shown that licensed centers and family day care homes provide a small proportion of all day care. However, it is most difficult to get a reliable enumeration of the informal sector.

Table 1 indicates the estimated importance of the informal sector. Although the data from the different surveys used in Table 1 are not strictly comparable, they are close enough for rough comparisons. Perhaps the most striking bit of information derived from Table 1 is the small percentage of children who receive day care in formal centers. The substantially higher percentage that we found in the Seattle survey may be due to the attempts being made by state, local, and educational groups to upgrade day care services in Seattle.

Ruderman found that Blacks were more likely to use out-of-home child care arrangements than were Whites. We also found this to be true in our Seattle and Denver day care utilization data. Furthermore, Ruderman found that the type of use was related to the family's socio-economic status (SES). She found that lower SES children have a substantially larger percentage of nonrelatives taking care of them. In part this may be due to ability to pay; but it may also be attributable to higher mobility rates of the high SES families, which usually means fewer relatives available for use as child care providers.

The surveys discussed above also showed that about 75% of the family day care homes provide care for only one or two children on a full-day basis, and that about 20% of all FDCH children are less than

Table 1

PERCENT OF DAY CARE PROVIDED WITHIN THE THREE MAIN SECTORS

	Low-Spindler[a]	Ruderman[b]	Westinghouse-Westat[c]	Denver[d]	Seattle[e]
In-home	57.7%	51.9%	40.6%	25.0%	37.5%
Unlicensed family day care home	36.9[e]	42.6[e]	49.2[e]	61.9	35.6
Licensed family day care home				5.0	9.8
Center	5.4	5.5	10.2	8.1	17.1

[a] See [12], p. 71, Tables A-2 and A-3.

[b] See [18], p. 212, Table 49.

[c] See [27], pp. 179-180, Tables 4.28 and 4.29.

[d] Data collected from the Seattle-Denver Income Maintenance Experiment.

[e] This consists primarily of unlicensed family day care homes.

two years old. The Westinghouse-Westat study also found that most center staff are neither well educated nor well paid. They found that most directors and "teaching" personnel did not have college degrees; and very few had any special formal off-the-job training in child care. It was estimated that less that 2% of all FDCHs are licensed, whereas about 90% of all centers appear to be licensed by some public agency.

Licensing Considerations*

Licensing of FDCHs is mandatory in 38 states, while center licensing is required in all states except Mississippi, where it is voluntary. In-home care is rarely licensed, but some localities have regulations for I-H providers, especially where infants are involved. In some states there are significant gaps in coverage where licensing is not mandatory for all cities or counties and, when it is mandatory, enforcement is relatively lax, especially as it concerns FDCHs.

In general, licensing requirements, such as for zoning, fire safety, and building code and program requirements, are far less stringent for FDCHs than they are for centers. Child/staff ratios and space per child requirements are, on the other hand, quite similar for centers and FDCHs. In fact, since FDCHs are rarely licensed for more than six children, the average child/staff ratio is usually lower for FDCHs than for centers.

We find that child/staff ratio requirements vary widely. For FDCHs, the required ratio for children aged 0-14 years of age went from 2:1 in Massachusetts to 7:1 in South Carolina.† However, for most of the states, the requirement was one caretaker for every six children (6:1) for that age group. It is also true that most states have some type of restriction on the number of children under 2 years of age that can be included in the total number of children allowed per caretaker.

---

*Much of the data for this section comes from [15].

†These ratio requirements were in effect prior to the Title XX Amendment to the Social Security Act, which increased staff requirements.

For centers, the child/staff ratio required by state regulating agencies almost always varies according to the age of children cared for. Furthermore, stratification by age may differ from state to state, although there are also some similarities. For states in which children who are less than 3 years of age are cared for, the lowest child/staff ratio, 5:1, is found in Alaska, while the highest ratio, 10:1, is in Arizona. For children aged 6-14, the child/staff requirements go from 15:1 in Florida and Nevada to 30:1 in Tennessee, with several states having a requirement of a minimum of one caretaker for every 25 children aged 6-14.

During the past decade there have been a number of attempts to upgrade the level of child care delivered to preschool children. These efforts have focused on nursery schools and day care centers. However, they have been hampered by the difficulty of assessing the type of care that is desirable. "There are no adequate measures of the effects of different kinds of child care, once abusive, unsafe care has been ruled out" [17]. In lieu of an adequate instrument to assess the quality of day care, staff size relative to the number of children cared for is often equated with high quality child care. "The staff-child ratio, although a very imperfect yardstick, is in our present state of knowledge the principal indicator of both costs and quality as we know them" [17 (italics in original); see also the section below concerned with quality considerations]. Because of this view, which appears to be held by many in the field of child development, the tendency has been to apply pressure to regulatory agencies to have the child/staff ratios lowered, at least for centers. What may be happening, therefore, is that in those states where the advocates of high quality child care are influential, there has been a reduction in the number of children who can be enrolled in a center for each available caretaker. The range of child/staff ratios may then reflect the relative power of child development advocates.

It was also found that fire safety, health, and building regulations become more stringent as population density increases, with the

urban metropolitan areas having the most stringent regulations. On a national level, the following average delays were found in the licensing procedure: fire inspection, 65 days; sanitation inspection, 35 days; health inspection, 35 days; and zoning, 50 days. Since these can be sequential, the total delay can range from an average of 65 to 185 days (2 to 6 months).

Provider Characteristics

Child care is a labor-intensive process. About three-fourths of the input costs for day care services consist of payment to providers. With that level of importance, it will be useful to review characteristics of the day care labor inputs. Some characteristics of the providers of day care services are more relevant to quality or cost considerations, and these will be discussed in the next section, as well as in Part V. However, there are some general characteristics of the provider, and of the relationship between the provider and the child being cared for, that are relevant to a discussion of the supply of day care services. Most of our discussion with regard to providers is derived from data in Tables 2 and 3 below.

In both cities, the I-H providers were generally younger than providers in other sectors. Licensed FDCH operators tended to be somewhat older than providers in all other sectors, including centers, while in Seattle, the unlicensed FDCH operators and the center staff were approximately the same average age. However, as we can see from Table 2, the distribution of providers by age group does not follow the same pattern seen in the averages. For example, although the average age of unlicensed FDCH operators and the staff of for-profit private centers is about equal, we find that the largest grouping in the center is for 20- to 29-year-old staff, while for the unlicensed FDCH operators, the largest grouping is in the 19 and under and the 30- to 49-year-old group.

Although a larger proportion of the I-H providers in both cities, and of the unlicensed FDCH providers in Seattle, were in the youngest

Table 2

AGE AND RACE OF DAY CARE PROVIDERS, AND RACE OF CHILDREN
(Percent of Total)

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit							Nonprofit		
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private
Racial/ethnic group (providers)														
Black	20.0%	51.9%	22.9%	18.5%	20.2%	26.8%	5.0%	25.0%	42.3%	16.8%	22.1%	14.8%	35.0%	4.9%
Chicano	4.0	0	0.5	2.2	1.5	5.4	1.7	30.0	26.9	12.0	16.3	9.1	26.1	4.9
White	72.0	44.4	73.8	74.2	73.2	66.1	85.0	45.0	29.8	70.0	58.3	76.1	33.1	87.7
Racial/ethnic group (children)														
Black	23.0%	47.7%	20.7%	33.7%	35.8%	66.6%	17.0%	20.8%	37.7%	15.0%	23.2%	26.0%	29.2%	16.1%
Chicano	0	0	1.5	2.3	2.3	2.7	1.3	33.9	33.2	10.5	16.4	9.2	31.9	5.7
White	67.2	50.0	70.0	56.5	54.1	23.1	73.9	45.3	24.7	71.1	57.9	61.9	36.1	75.4
Age														
50 and older	8.0%	7.4%	28.4%	12.5%	12.6%	7.1%	17.5%	15.0%	19.3%	22.8%	20.9%	21.6%	17.8%	26.3%
30-49	4.0	33.3	48.6	24.8	26.8	34.0	8.8	25.0	27.8	46.7	32.9	39.8	35.7	20.0
20-29	16.0	22.3	23.1	50.8	51.0	46.4	54.4	25.0	42.3	29.9	38.3	27.2	44.0	38.7
19 and under	72.0	37.0		11.9	9.6	12.5	19.3	35.0	10.6	0.6	8.0	11.4	2.5	15.0
Average age (years)	23.6	30.2	41.8	31.8	32.2	31.3	30.8	31.3	33.3	40.8	36.7	38.0	36.3	36.2

Source: The source of all tables in Chapters 2 to 5 is the survey undertaken by SRI in Seattle and Denver during May 1974, unless otherwise specified.

Table 3

SELECTED CHARACTERISTICS OF DAY CARE PROVIDERS

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit							Nonprofit		
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private
Worked at full time job other than child care (% yes)	52.0	66.7	87.4	NA[a]	NA	NA	NA	55.0	66.3	88.0	NA	NA	NA	NA
Gross rate of pay per hour on last full time job (mean)[b]	$2.37	$2.02	$2.23	NA	NA	NA	NA	$1.40	$1.83	$2.08	NA	NA	NA	NA
Average number of years providing child care service in given sector (years)	3.8	2.0	5.4	2.2	2.4	1.6	2.1	3.4	4.3	5.4	2.7	2.2	2.8	3.2
Average number of months provider has cared for child currently being cared for (months)	14.7	6.3	11.4	NA	NA	NA	NA	12.5	11.3	10.3	NA	NA	NA	NA
Percent of children cared for, during period when other children are cared for for pay, who are sons or daughters of provider (%)[c]	0	22.1	23.3	7.9	9.0	7.1	5.0	9.4	30.6	22.8	12.0	11.4	12.7	11.2

[a]NA = not available.

[b]The date of last job varies over a three-year period prior to the date of this survey. Therefore the absolute level of these rates of pay are very approximate indicators of earnings. However, the relative values between sectors and cities is more useful for comparative purposes.

[c]For centers, the figures represent the percent of staff whose own child was in attendance at the same center.

age groups, we still find that a majority of these providers had previously held some full time paid job other than child care, as shown in Table 3. However, in both cities we find that, whereas somewhat over half the unlicensed providers had prior full time employment, almost all the licensed FDCH operators had previously engaged in full time work.

Moreover, there is no apparent systematic relationship between the two cities or between licensed and unlicensed sectors, so far as the average number of years that the day care operators had provided child care. Except for the unlicensed FDCH sector, however, the average years providing care was very close when comparing the two cities for each of the other sectors. We also found that in the three sectors for which data were available, on the average about 6 to 15 months of care was provided, with the I-H providers in both cities generally caring for the same child the longest period of time.

Another relevant characteristic of providers, so far as the supply of child care services is concerned, is their racial/ethnic composition. It is relevant at least in view of the fact that the racial/ethnic composition of children using day care services is highly correlated to that of providers. In Seattle, the percentage of providers who were from minority groups (Black or Chicano) was about the same for all sectors other than unlicensed FDCHs, where the percent of minority members involved was much greater. However, in Denver the distinction is between formal and informal sectors, with the former having a significantly lower percentage of providers who were from minority groups. But within the center sector we find that the public centers are comparable, insofar as minority member involvement is concerned, to the informal sector, while the for-profit private centers have the lowest minority member participation. In Seattle, the proportion of day care providers who are minority group members is roughly the same in all sectors except for unlicensed FDCHs and the private for-profit centers, with the percentage much lower in the former and much higher in the latter.

The racial/ethnic breakdown of the children who were being cared for was fairly consistent with what we found for providers. The percentage of children who were Black or Chicano was almost exactly equal to the comparable provider percentages for all except the center sector. In that sector in Seattle, we found that a large proportion of the children were from minority groups relative to the providers; this was especially true for the public centers. In Denver, the proportion of children from minority groups was also somewhat larger than the proportion of providers from those groups, but only for the private nonprofit and for-profit centers.

When we look at the percentage of providers who cared for their own children simultaneously with others, some of whom could have been related to the child care vendor, we find a different relationship between sectors and cities. In Seattle, none of the I-H providers cared for their own children during the time that other children were being cared for, while about one-quarter of the unlicensed and licensed FDCHs, and almost a tenth of all center staff, had their own child in attendance. In Denver, the percentages were comparable for licensed and unlicensed FDCHs, and for centers and I-H providers. So, for child care operators providing care while their own children were in attendance, the licensed and unlicensed FDCHs were comparable in and between both cities, while the I-H providers and center staff were reasonably comparable, with the exception of the Seattle I-H providers.

In almost all instances, the percentage of providers and of children being cared for who were minority group members was larger than the proportion of the total population of Seattle and Denver who were in those minority groups. In Seattle, slightly over 10% of the population was Black or Chicano (according to the 1970 census tabulation), while in Denver it was 26%. One important reason why our day care sample ratios for minority members are so much greater, in general, than similar ratios for the entire city population, is the selection process used in obtaining our sample. Our method for selecting I-H unlicensed FDCH respondents was biased toward lower income areas in Seattle and

Denver, due to the fact that names of potential respondents were obtained from the SIME/DIME sample, which is biased toward lower income census tracts. That bias does not hold for the licensed sector, where we obtained complete listings of providers. Consistent with that, we found that the percentage of providers and of children who were minority group members in centers and licensed FDCHs was almost the same as the proportion of minority group members in the overall city population, except for some sizeable discrepancies within the center sector. In Seattle, this was especially true for public centers, and in Denver there was a sizeable difference for the private for-profit centers.

We also found that a significant number of children being cared for were related to the providers. Table 4 shows the percentage by racial/ethnic groups. These relationships include the provider's own child as well as other relationships. In Seattle, there is not a great deal of variation, except for Black I-H and White unlicensed FDCH providers. In Denver, on the other hand, a far larger percentage of the unlicensed sector providers cared for children who were related to them than was found to hold for the licensed FDCH operators. Among Chicanos in Denver, there appears to be a preference for the use of unlicensed providers who are part of the extended family. This seems to be especially true when compared with Whites. (This may simply be a reflection of relative spatial living patterns among Chicanos versus those found for Whites or Blacks.)

Considerations of Quality

As mentioned earlier, the quality of care provided by child care vendors is very hard to assess. There are several alternatives having the potential to help form this kind of judgment. One view of child development says that in the early years a child needs a warm, nurturing environment in which it can develop its latent abilities. In conjunction with this view, it is held that when an adult has "too many" children to care for, a warm and nurturing atmosphere is less likely. Consequently the child/staff ratio is used as an indicator of the quality of care being provided, with the assumption being that the lower

Table 4

CHILDREN RELATED TO CHILD CARE PROVIDED BY RACE/ETHNIC CLASS OF PROVIDER[a]
(Percent of All Providers)

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit		For Profit					Nonprofit		For Profit
Provider's Race/ Ethnic Class	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
Black	40.0%	28.2%	24.2%	NA[b]	NA	NA	NA	57.1%	62.2%	24.3%	NA	NA	NA	NA
Chicano	<1.0	<1.0	<1.0	NA	NA	NA	NA	64.3	80.9	43.4	NA	NA	NA	NA
White	22.0	40.0	27.2	NA	NA	NA	NA	44.0	49.1	23.2	NA	NA	NA	NA
All providers	25.9	34.5	26.7	NA	NA	NA	NA	52.8	64.0	25.4	NA	NA	NA	NA

[a]Includes sons and daughters, as well as other related children. The values given refer to the percentage of all providers who had one or more related children in their care.

[b]NA = not available.

the ratio, the higher the quality of care. In judging the quality of care, the child/staff ratio is often used as the main operationally definable criterion.

Other measures that can be used to determine the quality of care are the types of materials and equipment supplied to the children, as well as measures of cognitive achievement or other developmental attributes. Adequately specified measures of achievement* are very costly to administer over any reasonable sample of children, and agreement as to the effect of various types of equipment or materials on the quality of care provided is difficult to find.

From the data collected in our Seattle and Denver surveys, we have two principal ways of measuring the quality of care: child/staff ratios and a self-reported measure of the percent of total care devoted to educational-developmental activities. Both sets of data will be used, along with some inferential data for centers.

Child/Staff Ratios

As stated, the usual criterion used in discussing the quality of day care being provided is the number of children cared for per staff member. For all but centers, this ratio is simply the number of children cared for divided by one.† Table 5 presents these child/staff ratios for each sector in both Seattle and Denver.

What we find is that in both cities the informal sector providers care for a smaller number of children, i.e., they have a lower child/

---

*SRI is currently administering a set of such measures in an attempt to assess the quality of care in a national sample of day care centers.

†In presenting these ratios we have not made adjustments for part time care, on the part of either the children or the providers. For our purposes a child is a child, and a provider a provider. In using these ratios to assess the quality of care, we are simply making comparisons between sectors and cities, rather than attempting to determine the absolute level of quality. For our purposes, therefore, assuming no systematic difference in part time involvement between sectors, we believe our approach to be adequate.

Table 5

CHILD/STAFF RATIOS[a]
(Mean Values)[b]

SEATTLE							DENVER						
Unlicensed		Licensed					Unlicensed		Licensed				
			Centers							Centers			
				Nonprofit		For Profit					Nonprofit		For Profit
In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
1.9	3.2	5.2	4.6	4.6	3.3	5.5	1.8	3.7	4.6	5.4	4.8	4.6	6.9

[a]For all sectors, other than center sectors, the ratio represents the number of children currently enrolled to a single provider; for centers we use all regularly paid staff members as the denominator. In assessing quality of care, use of all staff members in determining the child/staff ratio biases the results toward a lower ratio than would be true if we excluded staff members, such as cooks, who did not deal directly with the children in their child care activities. However, only about 6% of all staff in either city do not deal directly with children in their child care activities.

[b]All figures are given as a ratio to 1, i.e., if 4.1 is given this implies a 4.1:1 ratio. Moreover, the children in the ratio include the provider's own children, who are cared for at the same time that other children are cared for for pay.

staff ratio. On this basis, we might infer that the informal sector providers deliver, on the average, a higher quality of care. However, another characteristic of the providers that affects the quality of care is their educational attainment.* Assuming that the higher the educational attainment of the provider the greater the quality of care provided, all other things remaining the same, we see from data on educational attainment that what we inferred from the child/staff ratios might have to be qualified. Table 6 shows that the informal sector providers in both cities generally have a lower average level of educational achievement. Moreover, almost none of them had two years or more of college, whereas a significant number of the licensed FDCH providers did, and from about half to two-thirds of the regularly paid staff of all centers had at least two years of post-high school education.†

We can also see from Table 5 that within the center sector, the for-profit private centers have the highest child/staff ratio, while the public nonprofit centers had the lowest ratios. Although this is true in both cities, there are significant differences in the magnitudes between sectors in Seattle versus Denver. In Seattle, the nonprofit public centers have an average child/staff ratio that is considerably lower than that for the other two components of the center sector. And in those two, nonprofit private and for-profit private, the child/staff ratios are much closer, with the for-profit private centers having the higher ratio. In Seattle, on the other hand, the ratios for both nonprofit components were very similar, while the for-profit private center ratio was considerably higher than either of the others.

---

*There are also a host of personality correlates, for which we have no data, that are relevant in assessing the quality of care provided.

†We also found that the I-H providers were significantly younger than those in the other sectors. Moreover, 48% of the I-H providers in Seattle and 25% in Denver were enrolled in school on a full time basis, mainly high school, at the same time that they were providing child care.

Table 6

EDUCATION OF PROVIDER

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit							Nonprofit		
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private
Highest grade completed (mean years)	10.8	11.1	12.0	14.2	14.2	14.5	14.0	9.8	10.7	11.5	13.3	13.2	13.2	13.6
Percent of providers with:														
10 years or less of schooling completed	36.0%	33.3%	18.7%	4.1%	3.5%	5.6%	5.0%	60.0%	36.5%	28.7%	11.7%	12.5%	13.9%	6.3%
14 years or more of schooling completed	4.0	3.7	22.4	62.7	62.4	68.5	58.3	0	6.7	15.6	47.4	47.7	45.6	50.6

The reasons for variations in the child/staff ratios are difficult to explain from the data collected. However, there are some clues from the survey that we can use to suggest possible causes. In the center sector, the extent of subsidization, especially for the public centers, appears to be a determining factor in the existence of lower child/staff ratios. Also, the orientation toward making a profit would tend to promote the use of as few staff as possible, especially since labor costs constitute about three-fourths of all variable costs for center operations. This would lead to higher child/staff ratios in the for-profit private centers. In the other sectors, a possible explanation of the fact that child/staff ratios increase, in both cities, as we go from I-H to the more formal child care arrangements, is that for the latter there is more of a business-like orientation toward the provision of child care. In that sense, the licensed FDCH would be more likely to maximize use of their inputs (labor) in generating their outputs (child care). Other explanations are possible, such as personal inclinations with regard to the desire for taking care of no more than a given number of children; but such speculations would take us completely outside the realm of our survey results. We can, however, continue to use our data in assessing quality of care by reviewing the percentage of time that day care vendors claim they devote to educational-developmental care.

Type of Care Provided as Perceived by Vendors

In the survey, there were a series of questions from which we attempted to apportion the time spent by day care vendors into: (a) hours devoted to activities that could be classified as educational-developmental, and (b) hours devoted to activities that could be classified as purely custodial care. (See Appendix C for a discussion of the method used in classifying hours of care.) However, there is no clear distinction as to what constitutes custodial care (see discussion of custodial care in Part V); moreover, we have no way of verifying that the elements of custodial care as perceived by vendors in the survey were comparable between respondents. In general, it appears

from discussions with day care proprietors that "good" custodial care consists of a facility that conforms to required fire and other safety features, provides meals and adequate napping accommodations, has no systematic interactions with parents as far as their child's development is concerned, uses a limited set of equipment, and indulges in a very limited amount of planned activities, but does provide an overall warm and accepting environment for the child.

Given the limitation of our data insofar as determining some objective measure of the quality of care, we can use the data in Table 7 as indicative of how respondents perceive and classify the type of care they are providing. Using our method for calculating educational-developmental care (see Appendix C), we found that the I-H and unlicensed FDCH providers in Seattle said that approximately one-tenth of their time was devoted to such care, while in the licensed FDCHs in Seattle and for all sectors other than centers in Denver, about a fifth of the time devoted to child care was perceived as being spent in educational-developmental activities. The proportion of the week spent on higher quality care was somewhat greater for centers--overall, one-third in Seattle and slightly less in Denver. In the latter city, there was very little difference in the percent of time devoted to such care between different proprietary types. However, in Seattle, the public centers reported spending almost half their time in educational-developmental care, while the other centers show slightly under a third of their time being used in that type of care.

Within the center sector, there was also a substantial amount of time devoted to "other" activities. A significant part of the "other" activities were administrative tasks.* There was a large difference in the percentage of staff time devoted to administrative tasks among the three proprietary types in the Seattle centers: public nonprofit centers devoted an average of about 16% of their time to such tasks,

---

*Other tasks grouped under the "other" category included cooking, household maintenance, etc., that could not be classed under the other categories used.

Table 7

PERCENT[a] OF CHILD CARE TIME DEVOTED TO VARIOUS TYPES OF CHILD CARE

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit		For Profit					Nonprofit		For Profit
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
Custodial care	85.5%	91.4%	77.5%	42.7%	42.2%	36.2%	50.6%	80.0%	80.9%	77.7%	40.4%	44.7%	36.3%	43.7%
Educational-developmental	11.6	8.5	20.1	32.0	29.1	45.9	28.6	18.4	16.9	19.9	27.9	23.8	29.8	28.9
Other	2.9	0.1	2.4	25.3	28.7	17.9	20.8	1.6	2.2	2.4	31.7	31.5	33.9	27.4

[a]Represents percent of all time spent in providing child care.

while the profit-oriented centers spent about 5% of their time on administrative matters. In Denver, the distribution among proprietary types with regard to the percent of time spent in administrative tasks was fairly uniform, ranging from about 13% for private for-profit centers to a little over 16% for the public nonprofit centers.

Health Care Services

For centers, there is another possible indicator of the quality of care provided--available health care services. Table 8 shows the range and extent of involvement of centers in these services. Public centers seem much more likely to provide a wide range of such health services, although the other centers also provide a substantial number. Except for dental checkups and psychological testing, the Denver centers appear to provide very few health care services to the children in their care, and when such care is provided, the Denver centers are much less likely to pay for them than are the Seattle centers.

Table 8

HEALTH CARE SERVICES PROVIDED TO CHILDREN IN DAY CARE CENTERS

	SEATTLE				DENVER			
		Nonprofit		For Profit		Nonprofit		For Profit
	Total	Private	Public	Private	Total	Private	Public	Private
Dental checkups								
Percent providing	17.9%	20.0%	45.0%	0%	23.4%	23.1%	41.2%	5.9%
Percent paying for service	41.7	28.6	60.0	0	9.1	33.3	0	0
Physical examination								
Percent providing	16.4	14.3	45.5	4.8	8.5	7.7	11.8	5.9
Percent paying for service	63.6	60.0	60.0	100.0	0	0	0	0
Immunization								
Percent providing	44.8	45.7	72.7	28.6	2.1	0	5.9	0
Percent paying for service	23.3	18.8	37.5	16.7	0	0	0	0
TB tests								
Percent providing	11.9	11.4	18.2	9.5	2.1	0	0	5.9
Percent paying for service	62.5	50.0	100.0	50.0	0	0	0	0
Psychological tests								
Percent providing	11.9	8.6	9.1	19.1	27.7	30.8	41.2	11.8
Percent paying for service	50.0	33.3	100.0	50.0	15.4	25.0	0	50.0

III SUPPLY CONSTRAINTS

In this chapter we will discuss barriers to entry, capacity considerations, and some special needs of child care users. Data regarding barriers to entry are concerned mainly with the licensed sectors of the day care industry, although the extent to which licensing is enforced, especially with regard to FDCHs, will effectively restrict entry into the unlicensed sector.

Barriers to Entry*

Day care licensing requirements are quite similar in Seattle and Denver. The minimum requirements for licensing centers and FDCHs in both cities are concerned with enforcement of fire and health code standards, along with some restriction on staff/child ratios. The latter condition is especially relevant for federally funded centers, but again the regulations are similar in Seattle and Denver. In practice, there are probably differences in the way that individual fire or health inspectors view code enforcement, so that within-city differences among inspectors may be as great as between-city differences. There may also be some variance with regard to case worker concern and evaluation of the day care providers. However, both cities have a fairly well-educated class of social workers, and our interviews with some of them leads us to the view that there was no systematic difference between the two cities concerning the way the case workers judge the fitness of day care providers.

In both cities, the licensing regulations for centers and FDCHs are in a state of flux. On the one hand there is pressure to simplify

*Much of the material on barriers to entry is concerned with licensing and zoning and is based on interviews conducted by Mae Stephen of SRI.

the regulations, while on the other there is pressure from the federal level for more stringent regulations, especially with regard to staffing of centers and child care training for FDCH providers. Moreover, there is a plethora of agencies (health, sanitation, zoning, building, and fire) at state, county, and local levels that are involved in the licensing process. Each brings a sometimes conflicting, and sometimes costly, view of the minimum licensing standard requirements.

The actual enforcement of day care licensing regulations is a relatively recent phenomenon in both Seattle and Denver. In conjunction with this, inspectors from health or fire departments tend to use standards developed and applied to other types of facilities or institutions when inspecting centers and FDCHs. For example, nursery schools in Denver must be licensed, even though their programs last only three hours during the day.* Moreover, these nurseries must have commercial-type dishwashers and cooking facilities if they serve any food.

The licensing staff in both Seattle and Denver feel that from the point of view of the safety and development of the children cared for, the licensing requirements are minimal at best. However, they also feel that regulatory enforcement of the day care industry is relatively new, especially as it pertains to facilities other than federally funded centers. They are also cognizant of the many violations of the rules, and of the extent of unlicensed FDCHs in operation.† The violations, especially those concerning the number of children cared for at any one time, occur in the licensed as well as unlicensed homes. In general, the licensing personnel also feel that they are grossly understaffed, which means that they rarely make the required number of visits to each facility to provide effective monitoring of licensed day care.

---

*This is not true for Seattle, where children must be in attendance for at least four hours before licensing is required.

†Licensing is required for FDCHs in both cities, although the Seattle licensing agency appears to be more diligent in getting the unlicensed homes licensed.

Zoning restrictions are particularly burdensome to centers. In Denver, day care is treated as a light industry with regard to zoning. Therefore, it is very difficult to obtain a permit to locate centers in single family housing areas (RO and R1). Seattle's zoning laws are far more liberal and flexible, especially concerning FDCHs. Seattle recently enacted legislation that allows up to twelve children to be cared for in an FDCH,* whereas in Denver the maximum number of children allowed in licensed FDCHs is four, with a zoning variance needed to raise the number to six.†

Overall licensing standards for FDCHs are not considered too excessive in either Seattle or Denver.‡ Although it is not true that only a "fence and a phone" are needed to obtain a license, it is true that most applicants have little trouble becoming licensed FDCH operators. In Denver, less than 5% of all licensed FDCHs needed to make any change in their facility (which, of course, was their own home) that cost more than $100, in order to meet fire or safety standards. In Seattle, almost 14% of the FDCH operators had to expend that sum to meet the required standards.

On the average, the waiting time for acquiring an FDCH license is not very long. Almost 75% of the operators in both cities waited only two months or less for their license to be approved, with almost 60% waiting no more than one month. However, about 6% of all licensed FDCH providers had to wait at least six months for their license. Moreover, there appears to be a considerable amount of turnover among licensed FDCH operators. In Seattle, only 13% of the FDCH vendors had

---

*If more than six children are cared for, an adult assistant must be there. Therefore, the maximum child/staff ratio remains 6:1. There has also been an attempt to classify FDCHs licensed for seven to twelve children as minicenters, which would change their licensing requirements.

†In general, it is not difficult to obtain a zoning variance that allows up to six children in an FDCH.

‡The new child/staff requirements proposed under the title XX Amendment to the Social Security Act will make the standards for FDCHs receiving federal funds a bit more stringent, or costly. See S. Weiner [26].

their current license for five years or more, while slightly over half had it for less than one year. In Denver, about 16% had their license for at least five years, and almost 40% had it for less than one year. This is due only partly to turnover of existing operators, being attributable also to the emphasis on licensing of FDCHs during the past several years, especially in Seattle.

In Denver, we also found that over a third of the centers had been licensed for at least five years, while less than one-fourth had been licensed for that long in Seattle. As the proportion that have been licensed for less than one year is far higher in Seattle than in Denver (one-third versus one-fifth), it appears that the development of centers in Seattle has been a relatively recent occurrence, although there are some that have been in operation for a long period. Moreover, the growth has been most rapid for nonprofit centers in Seattle.

As we saw above, obtaining a zoning variance is more important for centers than for FDCHs. In Denver, almost a third of all centers had to obtain a zoning variance, whereas only a fifth of the Seattle centers needed to obtain such a permit. There was also quite a bit of variation within the center sector in Seattle. About a third of the private for-profit centers in Seattle required a zoning variance, while less than a tenth of the nonprofit public centers did. In Denver, about a third of each proprietary type needed a zoning variance.

In Denver, new fire standards were also put into effect on January 1, 1973. These standards implied some large expenditures, as they required panic hardware on doors,* one-hour fire proof doors, and a requirement that every room have an outside exit. These new standards forced some of the private nonprofit centers (mainly church-organized) to close down their day care facilities because they couldn't afford the changes.

---

*These are long handles that need only body pressure to open the door. Theaters generally have them.

Capital requirement is of course another important barrier to entry for centers.* Our measure of capital cost includes only the current market value of equipment, durables, vehicles, and average cost of structural changes made prior to receiving a license.† Unfortunately, due to a lack of reliable facility cost data, or other data with which such costs could be estimated (such as square feet of space used), we were not able to include the most important capital cost component: structure cost. In the private nonprofit sector, we did find that many centers were housed in churches. So assignment of the appropriate facility cost to the child care operations would have been very tenuous, even if overall facility cost data were available. Even with the obvious downward bias due to the exclusion of facility costs, we found that the average capital cost, as defined above, was $11,254 in Seattle and $19,026 in Denver. Although these are not trivial figures, they do not, by themselves, impose any serious barrier to entering the center sector. The average current market value of equipment and vehicles per currently enrolled child is also a reasonably low absolute amount: $127 for all centers in Seattle and $80 in Denver, with a high of $231 for public centers in Seattle and a high of $111 for private for-profit centers in Denver. (See Chapter V for more detailed data on costs.)

Capacity Considerations

The capacity of centers is given by the number of children for whom the center is licensed to provide care, a number based on meeting certain requirements, such as having the required child/staff ratio. We have constructed our own measure of capacity for I-H and FDCH providers (see footnote to Table 9).

---

*We examined the capital cost for FDCHs as well.

†Almost 56% of the 108 changes made in 44 centers in Seattle were to meet fire or safety standards; in Denver, almost 48% of the 108 changes in 35 centers were for these reasons.

Capacity utilization in Seattle and Denver is presented in Table 9. In the discussion to follow, we will use center capacity as measured by the ratio of full time equivalent enrolled children to licensed capacity, rather than using total current enrollment in the numerator. Using that measure, we find in Table 9 that in Seattle, the unlicensed FDCHs and the centers, as a whole, experienced the same level of capacity utilization, while the I-H sector showed a somewhat higher degree and the licensed FDCHs a much lower. Within the center sector in Seattle, we find the private for-profit centers showing the same level of utilization as the I-H sector, while the public centers were much closer to the rate found for licensed FDCHs.

In Denver, the relationship among sectors with regard to capacity utilization was quite different from that found in Seattle. Licensed and unlicensed FDCHs showed a fairly similar rate of utilization, while the I-H sector rate was slightly higher. Centers in Denver showed a much higher utilization rate, both overall and for each of the three proprietary types.

In general, there is about a 15% to 20% underutilization of measured capacity in the day care industry in Seattle and Denver. Analogous to what has been found in industrial activities, it may be that day care providers reach an optimum level of efficiency, in terms of their interaction with children cared for, at about 85% utilization of their child caring capacity.

Although the overall average level of capacity utilization is about 85%, there are significant numbers of day care providers in the different sectors who utilize 100% (or more*) of their capacity, according to our measures. In the I-H sector, almost half of the Denver and three-fourths of the Seattle providers utilize 100% of their capacity; in the unlicensed FDCH sector, the percentage with 100% utilization is far less, about one-twentieth in Seattle and one-tenth in Denver; in the licensed FDCH sector; about one-third utilize their capacity fully.

---

*See Table 9, footnote b.

Table 9

PERCENT OF CAPACITY UTILIZED[a]

SEATTLE							DENVER						
Unlicensed		Licensed					Unlicensed		Licensed				
			Centers							Centers			
				Nonprofit		For Profit					Nonprofit		For Profit
In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
93.0%	84.0%	66.0%	85.1%	83.7%	74.7%	92.7%	85.0%	78.0%	76.0%	96.6%	99.6%	102.3%[b]	90.9%
			(98.6)	(97.8)	(83.2)	(107.3)				(109.9)	(113.1)	(118.6)	(102.2)

[a]For I-H and FDCH vendors, the percent of capacity utilized was constructed as follows: (1) we obtained the maximum number of children taken care of for pay during any day of the week; (2) we multiplied that figure by the maximum number of hours that the provider took care of children for pay during each day of the week, which is our measure of capacity; (3) the sum of item (2) was then divided into the actual hours of paid care that the provider stated that she had worked during the week, which is the percentage of capacity utilized. For centers, it represents the ratio of full time equivalent enrolled children to licensed capacity, multiplied by 100; and in parentheses it represents the ratio of currently enrolled children to licensed capacity, multiplied by 100.

[b]For centers, capacity utilization is measured as the ratio of current enrollment (as of the survey date) to the number of children for whom the center is licensed to provide care. Since current enrollment includes part as well as full time children, the ratio sometimes exceeds 1.0.

In the center sector, about half the providers in each proprietary type utilize 100% of their licensed capacity, except for the private nonprofit centers in Denver, where slightly over 90% are fully utilized.

So it is not at all surprising that some of the providers have waiting lists. We found that only about 6% to 10% of the unlicensed (I-H and FDCH) providers in either city had a waiting list containing one or more children. In fact, in Seattle none of the unlicensed FDCHs have an active waiting list. Licensed FDCHs were slightly more likely to have a waiting list, with about 14% of these providers in Seattle and 19% in Denver having a list with one or more children on it during the period of the survey. Centers, on the other hand, were generally more likely to have a list of children waiting to enroll. About two-thirds of the nonprofit private centers had such a list in Seattle and Denver, about three-fourths of public nonprofit centers had one, and approximately half of the private for-profit centers in both cities had waiting lists. In general, those who use day care need it immediately, so if a desired facility is not available they go to a less desirable facility or mode of service. This may help to explain the large percentage of centers with waiting lists, especially the public centers. Since the survey was taken in May, and we find a substantial decline in child care use during the summer, the day care centers' waiting lists may reflect a desire for fall enrollment. This could mean either planning ahead for families using child care for the first time for a particular child, or a desire to change from the child care facility or mode currently being used.

Another important consideration with regard to capacity is the availability of day care slots for children of different ages. One of the frequently heard complaints concerning child care services is the lack of facilities for toddlers, i.e., children under 2 years of age. Table 10 indicates that a substantial proportion of the children cared for by licensed and unlicensed FDCH operators in both Seattle and Denver, as well as by the public nonprofit centers in Seattle, are toddlers. However, we do not have any indication of the possible unmet demand--for example, a waiting list by age of child. In general, we

found that centers were less likely to have children under 2 enrolled than were the other sectors. In fact, 85% of all the Seattle centers and almost 90% of those in Denver had no children under age 2 when interviewed, while in both cities, almost none of the private for-profit centers provided care for toddlers.

Aside from their age, it is of interest to note the average number of children cared for by the various provider groups. With the exception of centers, providers in the different sectors in both cities care for approximately the same number of children, on the average, as shown in Table 10. That is, the I-H providers in Seattle are comparable with the I-H providers in Denver with regard to the average number of children cared for, etc. For centers, the average number of children cared for in Denver is significantly higher than in Seattle. The variance is also greater for centers in Denver, where the largest center cared for 230 children. We also see in Table 10 that the public centers in Denver can be quite large, whereas the largest public center in Seattle had less than one-third the maximum enrollment found in Denver.

Another relevant factor regarding capacity is the number of hours of care provided. In the informal sectors, we find that providers in Seattle spend far fewer hours taking care of children. I-H providers in Seattle showed an average of 21 hours of care per week versus 38 in Denver, and the unlicensed FDCHs in Seattle provided an average of 30 hours of care per week versus 39 in Denver. In the formal sectors, the average hours of care per week in both cities was about 45.

Sick-Child Care

Another important aspect of child care service is whether it is provided to users when the child is ill. We asked whether a child with a minor illness, other than a simple cold, would, when ill, be taken care of during the hours that the child would normally have been cared for. The I-H providers almost all reported that they would take care of such children (see Table 11). The percentage dropped considerably for unlicensed FDCHs in both cities, but there were still about

Table 10

AGE OF CHILDREN USING DAY CARE AND NUMBER OF CHILDREN CARED FOR

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit							Nonprofit		
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private
Age (percent of total)														
Less than 2 years	9.8%	29.1%	16.2%	4.1%	3.2%	16.6%	0.5%	7.5%	18.2%	21.1%	2.7%	3.9%	4.8%	0%
2-5 years[a]	47.6	48.8	52.9	69.5	71.6	54.0	71.8	47.2	50.6	57.7	68.4	65.9	70.8	67.5
6 years and over[b]	42.6	22.1	30.9	26.5	25.2	29.4	27.7	45.3	31.2	21.2	29.0	30.4	24.4	32.6
Mean age[c]	5.3	3.6	4.6	4.0	3.9	3.8	4.1	5.7	4.7	4.0	4.1	4.1	3.9	4.3
Average number of children currently enrolled or cared for	1.9	3.2	5.2	41.9	46.1	29.6	41.1	1.8	3.7	4.6	60.1	54.3	59.9	64.6
Maximum number currently enrolled	3	7	14	135	135	66	120	2	12	10	230	87	215	230

[a] 2-4 years for centers

[b] 5 years and over for centers

[c] Estimates for centers

three-fifths in Seattle and over two-fifths in Denver who would provide ill-child care. However, in the licensed FDCH sector, only about one-fourth to one-third of the providers in either city provided such care, while a very small percent of the centers in either city would accept children with a minor illness. On the other hand, for the most prevalent of the minor childhood illnesses (a simple cold), almost all providers in both cities said that they would accept such children for regular care. For working mothers, being able to leave their children with a day care provider when the child has a minor illness is an important consideration in maintaining a steady work record.

Information

Most of the day care users found out about the child care services through friends, neighbors, or relatives. This was true in both cities and in all sectors. However, both Denver and Seattle provide a free day care referral service for licensed facilities. In Seattle, the service is provided by the State Department of Social and Health Services, whereas in Denver it is provided by a nonprofit agency, the Mile High Child Care Association. The percentage of all children enrolled in licensed facilities who were referred by these agencies is relatively low, about 10% to 25% in both cities, with Seattle being in the higher range. However, the percentages in both cities were considerably higher for public nonprofit centers.

Table 11

CARE PROVIDED FOR SICK CHILD
(Percent)

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit		For Profit					Nonprofit		For Profit
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
Provides care for sick child during regular day of child care	88.0%	59.3%	33.2%	7.5%	11.4%	0%	4.8%	85.0%	43.3%	26.4%	10.6%	15.4%	5.9%	11.8%
Takes care of child with cold for regular day of care	NA	90.9	92.3	90.3	87.1	100.0	90.0	NA	96.6	95.1	76.2	73.7	75.0	80.0

IV INCOME

This chapter highlights all the relevant data concerned with revenues, whether they came from fees or subsidies. The discussion will be grouped into three main subsections: subsidies, revenue and fees, and a brief discussion of the relative importance of day care vendor earnings in total family income.

Subsidies

In Denver, a private nonprofit group--the Mile High Child Care Association (MHCCA)--provides about one-fourth of all licensed child care. They operate under a contract with the City/County of Denver that pays MHCCA about $7.50/child/day for children enrolled in their centers, and about $4.00/child/day for children enrolled in their family day care homes.*

The children are from low-income families, coming mainly from WIN program participants, AFDC families, or eligible model city families. Users of MHCCA facilities make very little direct payment, if any, for child care services. A fee is charged if family income exceeds stipulated amounts, given family size. However, MHCCA never benefits from any fee charged to the user, since user fees are subtracted from the contract rate guaranteed by the county. The MHCCA also provides a general child care referral service for licensed care that is available to anyone in Denver.

Although MHCCA provides about one-fourth of all licensed day care in Denver, they provide a larger percentage of the licensed care for

---

*These rates are considerably higher than the Welfare Department's child subsidy rates in Denver, which in 1974 ranged from $3.00/day for the first child in a family that used child care to $1.90/day for the third and subsequent children from the same family.

preschool children. Prior to late 1973, MHCCA facilities were used only for preschool children. Since that date, however, they have started to get into programs that will provide day care for all children less than 13 years of age.

For centers, subsidy payment from the Department of Welfare in Denver goes directly to the vendor. If the child is cared for by an FDCH operator, licensed or unlicensed, the subsidy payment is made to the vendor only upon the written request of the day care user. Subsidy payment for I-H providers, including relatives, is allowed and is made to the user. An I-H provider who is related to the user must be over 16 and have foregone a paid position because of the child care duties, in order for the child to be eligible for a subsidy.

The Seattle welfare department also allows subsidies to be paid for child care by I-H providers who are related to the child. One difference is that in Seattle the provider must be at least 18 years of age. Reimbursement for I-H care goes only to users of the service; however, since August, 1973, subsidy payments for centers and FDCHs (only licensed, since unlicensed FDCHs are illegal*) are made directly to the vendor. Moreover, since early 1974, families with two financially responsible adults present are also eligible for day care subsidy under stipulated conditions, mainly where both are working and/or in training, or one is disabled. In Seattle, vendors are also confined to a maximum charge for subsidized children that is less than or equal to the subsidy rate. That rate for centers and FDCHs, as of mid-1974, was $5.31 per day for the first child in a family, $4.79 per day for the second child, and $4.26 for the third child, with an overall limit per family of $265.00 per month. For I-H care, the subsidy rates cannot exceed $0.75 per hour for the care of one to three children, and $1.00 per hour if four or more children are cared for.

---

*They are also illegal in Denver, although, as pointed out above, enforcement of the law in Denver was not as stringent in 1974 as it was in Seattle.

Table 12 shows the percent of child care users who are subsidized. There is very little intercity comparability in the percentages found, except for the fact that in both cities the public centers had far and away the largest percentage of users who were subsidized. In Seattle, we found that the percent subsidized was similar for the informal sector providers, and also for the formal sector providers. These relationships were especially valid for the fully subsidized users. However, within the center sector, as pointed out previously, the percent of subsidized users was far greater for the public centers. In Denver, the licensed and unlicensed FDCHs, along with all centers, had a roughly comparable rate of user subsidization, whereas the I-H providers showed the highest percentage of users being subsidized, not including the public centers.

In discussions with public and private agents concerned with child care in Seattle and Denver, we found that it is far easier for unlicensed vendors to be approved as recipients of child care subsidies in Denver than in Seattle, i.e., that children cared for by unlicensed vendors are more likely to be eligible for a subsidy in Denver. Moreover, the Denver agencies appear to be more liberal with regard to the payment of a subsidy for a child cared for by an I-H provider who is also related to the child. These reasons largely explain the much higher percent of fully subsidized children using unlicensed care in Denver.

Another way of looking at these phenomena is through the data presented in Table 13. There we see that Black and Chicano children whose fees are subsidized are more likely to use unlicensed care. From Table 13 we see that there is a sharp drop in the percent of users who are subsidized, for each racial group, between the licensed and unlicensed FDCH sector in Seattle, whereas in Denver that is not true for Chicanos or Whites, and far less important for Blacks.

The center sector caters to a higher income clientele in Denver than in Seattle, as shown in Table 12. In the former city, only about one-fourth of the users are subsidized, whereas in Seattle over one-third are subsidized. This is even more noticeable for the private for-profit centers in Denver, where almost none of the users are subsidized, while in Seattle over ore-fifth of similar users are subsidized.

Table 12

SUBSIDIZATION OF DAY CARE USERS
(Percent)

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit		For Profit					Nonprofit		For Profit
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
Fully subsidized	8.2%	9.2%	27.0%	28.9%	24.3%	71.3%	21.6%	35.4%	20.7%	15.7%	17.8%	5.1%	45.4%	0.2%
Partially subsidized	3.3	1.5	1.3	8.1	13.0	3.0	0.7	0	4.9	3.8	8.8	11.2	14.9	1.6
No subsidy	88.5	89.2	71.7	63.0	62.7	25.7	77.7	64.6	74.4	80.5	73.4	83.7	39.7	98.2

Table 13

PERCENT OF CHILDREN IN FAMILY DAY CARE HOMES WHOSE FEES ARE FULLY OR PARTIALLY SUBSIDIZED, BY RACE/ETHNIC GROUP OF CHILD

	SEATTLE		DENVER	
	Licensed	Unlicensed	Licensed	Unlicensed
Black	55.1%	11.8%	54.9%	27.6%
Chicano	35.7	-	24.0	31.2
White	18.7	10.3	11.5	13.6

We also have information on the amount of subsidy received per child by day care centers (see Table 14). As expected, public centers have the largest subsidy per enrolled child; however, the private nonprofit centers also have a sizeable subsidy. In fact, in Seattle both the private nonprofit and the public centers receive about 60% of their total revenue per child from subsidies and other donations. In Denver, however, while private nonprofit centers obtain about 60% of their revenue from subsidies and donations, public centers get 70%. We also see that in both cities, the subsidy is a one-time grant in very few cases. For the remainder of the centers, the subsidy was given on a monthly or annual basis.

Revenue and Fees

There is also a relationship, for centers, between subsidies and revenues. From a cross tabulation of revenue per child against percent of enrolled children who were subsidized, we found that there is a statistically significant difference in the revenue per child according to the percent subsidized (as seen in Table 15). For example, in Seattle, over four-fifths of the centers with less than half their children partially or fully subsidized had gross annual revenue per child that was less than $900; two-thirds of the centers with more than half the children subsidized had gross revenue per child that was over $900. This

Table 14

DAY CARE CENTER SUBSIDIES

	SEATTLE				DENVER			
	All Centers	Nonprofit Private	Nonprofit Public	For Profit Private	All Centers	Nonprofit Private	Nonprofit Public	For Profit Private
Subsidies and other donated revenues/currently enrolled children (mean)	$ 580	$554	$939	Negligible	$ 884	$524	$1,199	Negligible
Amount received 1973 (mean)	$17,800				$31,600			
Amount used 1973 (mean)	$15,200				$28,000			
Type of subsidy (percent)								
One-time grant	15.6%				3.4%			
Annual payment	37.5				27.6			
Other	46.9				69.0			

IV-6

Table 15

CROSS TABULATION BETWEEN REVENUE PER CHILD
AND PERCENT OF CHILDREN SUBSIDIZED, CENTERS

Gross Annual Revenue/Child (1973)	Percent of All Children Enrolled Who Are Fully or Partially Subsidized	
	Less than 50.0%	50% or more
Seattle		
Less than $900	81.6%	18.4%
$900 or more	33.3	66.7
N = 62		
Chi square level of significance = 0.0004		
Denver		
Less than $900	91.7	8.3
$900 or more	35.0	65.0
N = 44		
Chi square level of significance = 0.0003		

implies that the centers' gross revenue increases with an increase in subsidized users. This result holds for both cities and is somewhat more pronounced in Denver.

Gross earnings per month per currently enrolled child were calculated for all sectors, as were the corresponding fees per hour. The results of these calculations are presented in Tables 16 and 17. In the unlicensed (informal) sector in both Seattle and Denver, the earnings per child are very low, averaging about $20 to $30. Earnings per child rise somewhat for the licensed FDCH operators, at $42 per month in both cities. For the centers, there is a more substantial increase in the average gross monthly earnings per child.* Both cities are roughly comparable in their earnings per child, with the public nonprofit centers showing the highest earnings figure, approximately $140 per month per child in both Seattle and Denver. Table 16 also shows that there was a large variance in the gross earnings per child in all sectors for both cities, although almost all child care providers, except for centers, had gross monthly earnings per child of less than $100. In the center sector, about three-fourths of the public centers had averaged more than $100 per month per child of gross earnings, with about one-fourth of the Denver public centers receiving more than $200 per month per child.

It is of some interest to compare these earnings figures with standards of care, according to cost, estimated by others. The Children's Bureau of DHEW established the following costs per child per month for mid-1974† for three levels of care in child care centers:

---

*For centers, we really refer to gross revenue, since subsidies and donations are included, whereas for the other sectors there is very little involved other than earnings.

†The Children's Bureau figures were given as cost per child per year for 1968. We divided their figures by 12 to get a monthly average; then we adjusted their costs to reflect price level changes to mid-1974.

Table 16

GROSS MONTHLY EARNINGS

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit							Nonprofit		
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	For Profit Private
Gross monthly earnings per currently enrolled child[a] (dollars)	$ 18	$ 19	$ 42	$ 82	$ 77	$ 138	$ 64	$ 28	$ 22	$ 42	$ 101	$ 76	$ 143	$ 71
Maximum gross monthly earnings for currently enrolled child (dollars)	102	104	131	190	186	190	107	66	99	143	275	238	275	114
Percent with gross monthly earnings per currently enrolled child < $100	96.0%	96.3%	93.9%	74.2%	75.8%	22.2%	95.0%	100.0%	100.0%	95.2%	61.4%	84.6%	23.5%	85.7%
Percent with gross monthly earnings per currently enrolled child > $200	0	0	0	0	0	0	0	0	0	0	11.5	7.7	23.6	0

[a]For I-H and both FDCH sectors, this is gross earnings during April, 1974, divided by the average number of children cared for during that reporting period; for centers, it is total revenue, including subsidies, donations, etc., for 1973 per currently enrolled child during May, 1974, with the revenue adjusted for May, 1974, prices, and the sum divided by 12.

Table 17

FEES PER CHILD HOUR OF CARE[a]

	SEATTLE							DENVER						
	Unlicensed		Licensed					Unlicensed		Licensed				
				Centers							Centers			
					Nonprofit		For Profit					Nonprofit		For Profit
	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private	In-Home	Family Day Care Homes	Family Day Care Homes	Total	Private	Public	Private
Average hourly fees (dollars)	$0.46	$0.54	$0.54	$0.505	$0.470	$0.629	$0.500	$0.45	$0.43	$0.47	$0.493	$0.330	$0.485	$0.601
Maximum average hourly fees (dollars)	3.80	1.00	0.95	1.760	1.700	1.760	1.675	1.75	2.40	1.50	1.600	0.469	0.579	1.600
Percent with average hourly fees between 50¢ and 75¢	26.2%	51.9%	68.2%	25.9%	28.0%	25.0%	23.8%	10.4%	17.3%	28.9%	18.2%	0	40.0%	23.6%
Percent with average hourly fees less than 75¢	91.8	81.5	90.2	94.4	96.0	87.5	95.2	87.5	91.3	94.6	87.9	100.0	100.0	76.5

[a]For I-H and FDCH operators, this was calculated as the sum of the amounts paid per week for child care divided by the number of child care hours provided during that week; for centers, the hourly fees were based on weekly fees paid for a standard 40-hour week, with that sum divided by 40.

Minimum	$136/month/child
Acceptable	$204/month/child
Desirable*	$254/month/child

Our survey data for centers (Table 16) show that, on the average, only the public centers in either city came up to the costs needed to meet the minimum standards of care.† Even when we look at the maximum earnings figure, we find that some public centers in Denver earn slightly more than is needed to maintain a desirable level of care, while some private nonprofit centers are not too far below that figure. In Seattle, both nonprofit components are slightly below the acceptable level, insofar as earnings needed to sustain required costs. Moreover, in both cities the private for-profit centers have earnings that would prevent them from spending enough to achieve the minimum level of care developed by the Children's Bureau.‡ (See also Chapter V for another estimate of the cost of adequate custodial care.)

From Table 17, we find that in Seattle the average fees in all sectors range from about 45¢ to 63¢ per hour, while in Denver the average goes from 33¢ to 60¢ per hour. In most cases in both cities, over nine-tenths of all children pay less than 75¢ per hour for care; in all cases, over three-fourths of the children are charged fees less than that amount. However, in Seattle there is a very large variance between the average and the maximum fees charged by all providers, except by the nonprofit components of the center sector; in Denver, the variance is very large for all but the FDCH provider, where the range between average and maximum is not as marked.

---

*A study of high-quality centers conducted by Abt Associates came up with a cost per month per child, adjusted for 1974 prices, of $259.

†We assume that gross earnings are the total amount that will be spent, and therefore, that they are equivalent to the actual costs incurred. This probably implies a downward bias due to volunteer help and donated supplies.

‡Assuming they were to cover at least full cost. Moreover, volunteer help and donated supplies are far less important for the private for-profit component of the center sector.

Finally, to see whether reasonable predictions for earnings could be made from the data collected, and to see whether there were any racial/ethnic differences in those predictions, gross quarterly earnings for the first quarter of 1974 were regressed against seventeen independent variables for unlicensed FDCH operators in Denver* and against sixteen independent variables for licensed FDCH operators in Seattle and Denver. The results of these regressions can be seen in Tables 18 and 19. For the unlicensed FDCHs in Denver, we find from Table 18 that the significant coefficients are not unexpected. It is of some interest to note that earnings tend to increase with an increase in the proportion of the children cared for who are fully subsidized.† We also find that earnings increase for the oldest group of providers.

Similarly, in the estimated regression for licensed FDCHs there are no surprises in the signs of the significant coefficients, although there certainly is no theoretical justification for earnings to increase with the proportion of Black children being cared for, as in Seattle.

Using the estimated regressions along with the mean values of the independent variables, we can predict gross monthly‡ earnings for the FDCH operators. The predicted values are all shown in Table 20. Dividing these values by the average number of children taken care of during the survey period, we find that the predicted gross monthly earnings per currently enrolled child are somewhat lower in each instance from the values shown in Table 16. However, the predicted values are within one standard error of the actual measured earnings.

---

*There were insufficient observations in Seattle to use in estimating the specified regression equation for that city.

†This is consistent with the results found for centers, using a cross tabulation between revenue and percent subsidized.

‡The predicted value of gross quarterly earnings was simply divided by 3 to obtain monthly value, for comparison with the data in Table 16.

Table 18

PARAMETER ESTIMATES FOR GROSS QUARTERLY EARNINGS
IN DENVER[a] (Unlicensed FDCH)
(Dollars)

Variables	Parameter Estimates OLS	(Standard Error)
Weeks that provider has been FDCH operator (X_1)	0.0388	(0.0485)
Percent of total child care hours devoted to educational-developmental care (X_2)	22.54	(81.99)
Provider has previously worked in a day care center (X_3)	-111.45	(69.74)
Provider is age 30 to 49 (X_4)	5.70	(32.99)
Monthly expenditures on indoor equipment, supplies, and food (X_5)	0.049	(0.005)[b]
Child's fees are fully subsidized (X_6)	139.56	(36.38)[b]
Provider has a waiting list (X_7)	16.94	(58.45)
Provider is 19 years old or less (X_8)	-49.45	(58.55)
Child is not related to provider (X_9)	39.88	(30.81)
Provider is 50 years old or more (X_{10})	148.16	(44.96)[b]
Provider is Chicano (X_{11})	544.26	(227.60)[c]
Child is Chicano (X_{12})	-44.03	(72.75)
Provider is Black (X_{13})	387.85	(229.52)
Child is Black (X_{14})	98.38	(83.79)
Provider is White (X_{15})	592.06	(224.11)[b]
Child is White (X_{16})	-73.51	(72.35)
Weeks child has been cared for by same provider (X_{17})	-0.289	(0.194)
Constant	-440.92	(218.92)[c]

R^2 = 0.536
S.E. = 205.77
N = 104

[a] = There were too few observations to estimate a similar regression for Seattle.

[b] = Coefficient significant at 1 percent level.

[c] = Coefficient significant at 5 percent level.

Table 19

PARAMETER ESTIMATES FOR GROSS QUARTERLY EARNINGS
IN SEATTLE AND DENVER (Licensed FDCH)
(Dollars)

Variables	(Parameter Estimates, OLS (Standard Error) Seattle	Denver
Weeks that provider has been FDCH operator (X_1)	0.068 (.056)	0.141 (.056)[a]
Percent of total child care hours devoted to educational-developmental care (X_2)	973.35 (107.15)[a]	14.59 (106.30)
Provider has previously worked in a day care center (X_3)	64.87 (58.75)	14.00 (56.25)
Provider is age 30 to 49 (X_4)	41.06 (43.43)	124.05 (39.87)[a]
Monthly expenses on indoor equipment, supplies, and food (X_5)	0.015 (.001)[a]	0.042 (.003)[a]
Child's fees are fully subsidized (X_6)	149.17 (36.59)[a]	-44.16 (50.88)
Provider has a waiting list (X_7)	250.45 (39.36)[a]	2.42 (39.60)
Child is not related to provider (X_8)	154.48 (89.09)	237.44 (100.40)[b]
Provider is 50 years old or more (X_9)	286.69 (51.74)[a]	177.53 (51.09)[b]
Provider is Chicano (X_{10})	-132.30 (317.99)	-25.26 (196.79)
Weeks child has been cared for by same provider (X_{11})	0.598 (.246)[a]	0.834 (.294)[a]
Child is Chicano (X_{12})	-93.29 (128.98)	-56.25 (109.72)
Provider is Black (X_{13})	-120.32 (98.47)	-178.64 (194.43)
Child is Black (X_{14})	179.64 (69.88)[a]	70.20 (113.98)
Provider is White (X_{15})	-44.01 (89.12)	110.93 (190.20)
Child is White (X_{16})	72.07 (55.79)	-151.02 (95.22)
Constant	-2.18 (142.60)	50.42 (236.14)
R^2 =	0.400	0.390
S.E. =	429.10	367.26
N =	214	167

a = Coefficient significant at 1 percent level.

b = Coefficient significant at 5 percent level.

Table 20

PREDICTED GROSS MONTHLY EARNINGS
(dollars)

	Unlicensed FDCH	Licensed FDCH	
	Denver	Seattle	Denver
All groups	$41.53	$215.44	$140.78
Per child	11.19	41.65	30.89
Chicano[a]	43.70	131.10	128.47
Per child[b]	11.77	25.34	28.19
Black[a]	39.03	226.07	119.49
Per child[b]	10.51	43.70	26.22
White[a]	49.81	215.65	142.27
Per child[b]	13.42	41.69	31.22

[a] In obtaining the predictions for the three ethnic/racial groups, we let the value of the variable for both the relevant provider and the child equal one, while the other racial/ethnic variables were set equal to zero (for example, for the Chicano estimate we let the variables "provider is Chicano" and "child is Chicano" equal one, while the Black and White counterparts were set equal to zero).

[b] In each case, the overall average number of children cared for in the separate sectors and cities was used in the division.

Importance of Earnings in Family Income

Another item worth examining is the importance of child care earnings to the individual provider, and to the family of that provider. As we saw above, the earnings of I-H and FDCH providers are rather low. Half to three-fourths of the providers in every sector said that these earnings were their only source of personal income, as shown in Table 21. (The data available for this examination do not include center staff.) However, no more than 12% of the providers in any sector in either city said that their child care earnings constituted 90% or more of their total family income. On the average, between 72% and 88% of the providers

Table 21

PERCENT OF PROVIDERS' INCOME REPRESENTED
BY CHILD CARE EARNINGS

	In-Home Providers		Unlicensed FDCHs		Licensed FDCHs	
	Seattle	Denver	Seattle	Denver	Seattle	Denver
Percent of family income[a]						
35% or less	72.0	75.0	85.2	87.5	73.8	77.1
36-65%	4.0	20.0	11.1	6.7	11.7	13.9
66-90%	12.0	-	-	1.9	4.2	1.8
91-99%	-	-	-	2.9	1.4	1.8
100%	12.0	5.0	3.7	1.0	8.9	5.4
Percent whose total personal income was derived from child care services	60.0	65.0	48.1	56.7	62.1	73.7

[a]These are estimated ranges from the values actually given in our survey.

in both cities said that their child care earnings contributed one-third or less of their family earnings. The implication here is that in most instances child care earnings were a secondary source of family income.

Not only were the earnings of I-H providers low, but many were required to do other tasks for the earnings received: at least one-third of the I-H providers in Seattle and half those in Denver were required to perform household chores while providing child care. In fact, we found that almost half of all I-H providers in Seattle and about two-thirds in Denver were required to do at least one of the

following tasks: laundry or ironing for families, light housework, cooking for family members other than the children cared for, and heavy cleaning. Every provider required to perform these tasks said that the fees charged included payment for these additional tasks. Consequently, child care is only one component of the I-H provider earnings. (However, see the estimate of the custodial component of child care presented in Chapter V.)

V COSTS

Descriptive Review of Costs*

Because the cost data collected for FDCHs are not comparable with the center cost data, we will not be able to make comparisons among sectors in this section. However, we can compare costs between Seattle and Denver for FDCHs and for centers separately.

Tables 22 and 23 show the costs for unlicensed and licensed FDCHs, excluding any imputed cost of the providers' labor and any prorated share of the housing cost. In Table 22, we find that the costs in Seattle and Denver are quite similar for unlicensed FDCHs. In both cities, costs per month are low, with the bulk accounted for by expenditures on food. The net revenue obtained by subtracting those costs from average revenue was very low in both cities, and especially so for Seattle, where only $23 were left after the costs listed had been subtracted from the monthly revenue.

For the licensed FDCHs shown in Table 23, we find both costs and net revenues to be much higher than for the unlicensed FDCHs. In the former sector, there are some significant differences in the absolute amount spent on various items in Seattle versus Denver. But the main differences between the two cities in the relative weight of expenditures in the different categories of Table 23 are the amount spent on program supplies and the sum spent on advertising. In Seattle, almost a fifth of all costs are for supplies and a tenth for advertising, while in Denver not quite a tenth of the costs are for supplies and almost a fourth for advertising. Otherwise, the relative expenditures are about

---

*See Appendix D for a discussion of day care costs obtained from other studies.

Table 22

MEAN COSTS[a] AND REVENUE FOR
UNLICENSED FDCH PROVIDERS
(Recent Month)

	Seattle	Denver
Expenditures		
Indoor equipment[b]	$ 3.69	$ 1.96
Program supplies[c]	5.72	5.46
Other supplies, excluding food[c]	5.12	7.31
Advertising	0.59	0.04
Food for children[d]	21.74	19.17
Total expenditures	$36.86	$33.94
Revenue (for recent month)[e]	60.35	82.52
Revenue less expenditures	$23.49	$48.58

---

[a] It has been assumed that there is no additional cost for maintenance of the home owing to its being used as a facility for the provision of day care services.

[b] The 1973 average divided by 12 and adjusted for inflation from June 1973 to May 1974.

[c] Recent week's cost multiplied by 4.3.

[d] Includes food eaten by own children while in the home with children taken care of for pay.

[e] Revenue of first quarter of 1974 divided by 3 and adjusted for inflation from February 1974 to May 1974.

Table 23

MEAN COSTS[a] AND REVENUE FOR
LICENSED FDCH PROVIDERS
(One Month During 1st Quarter, 1974)

	Seattle	Denver
Expenditures		
Indoor equipment[b]	$ 7.50	$ 4.83
Program supplies[c]	21.50	6.97
Other supplies, excluding food[c]	21.50	12.94
Advertising	10.00	20.00
Food for children[d]	51.00	38.00
Total expenditures	$111.50	$ 82.74
Revenue (for recent month)[e]	$219.78	$194.17
Revenue less expenditures	$108.28	$111.43

---

[a] It has been assumed that there is no additional cost for maintenance of the home owing to its being used as a facility for the provision of day care services.

[b] The 1973 average divided by 12 and adjusted for inflation from June 1973 to May 1974.

[c] Recent week's cost multiplied by 4.3.

[d] Includes food eaten by own children while in the home with children taken care of for pay.

[e] Revenue of first quarter of 1974 divided by 3 and adjusted for inflation from February 1974 to May 1974.

the same in the two cities. Moreover, we find that the net revenue for the month* is approximately equal in Seattle and Denver.

Centers, unlike the other day care sectors, often have a large initial capital cost for buildings and equipment. Lacking adequate data, we have not been able to estimate the capital costs of buildings.† We have, however, been able to estimate the variable costs‡ of day care center operations. Table 24 shows these costs as an average per child, as well as by ratio to total revenue.§

Monthly variable cost per child averaged $95 in Seattle and $107 in Denver. In Seattle, the range was from $61 for the private profit-making centers to $158 for the public centers, with the private non-profit center falling about mid-way between these extremes. However, in Denver the range was about the same, but the private nonprofit centers had average monthly variable costs about equal to those of the private for-profit centers. If we estimate variable cost as a ratio to full

---

*The net revenue shown has not been adjusted to take account of payments made by the licensed FDCH provider for paid help. In general, these payments are very limited. Only 8% to 9% of the providers in Seattle have either a paid bookkeeper or other paid assistant, or both, while only about 4% of the providers in Denver paid for such help. Moreover, these services tend to be purchased on a very limited basis, and it appears unlikely that these payments would lower the average net returns by more than a few dollars per month. The issue is of even less importance for the unlicensed FDCH sector.

†For an empirical estimate of the cost of capital for family day care homes, see Appendix E.

‡Includes salaries and wages, insurance, rent, all utilities, janitorial service, purchase of nondurable supplies, advertisement, food, and amount spent on leasing equipment.

§In all cost and revenue estimates, price level adjustments have been made when a ratio is used and the numerator and denominator were not for the same period.

Table 24

RELATIONSHIPS BETWEEN VARIABLE COST, CHILDREN ENROLLED, AND TOTAL REVENUE
(Means)

	Seattle				Denver			
		Nonprofit		For Profit		Nonprofit		For Profit
	Total	Private	Public	Private	Total	Private	Public	Private
Monthly variable cost/ currently enrolled children	$94.84	$102.92	$157.57	$61.47	$107.11	$75.66	$160.46	$67.79
Variable cost/total revenue	.94	.97	1.15	.83	1.00	.88	1.06	1.01
Rate of hourly pay for center work	$ 2.71	$ 2.70	$ 3.18	$ 2.33	$ 2.62	$ 2.45	$ 2.95	$ 2.12

time equivalent* enrollment, rather than to total currently enrolled, the average value increases by 7% to 12%, but the relationship between proprietary types does not change.

The ratio of variable cost to total revenue for public centers in both cities, as well as for the private for-profit centers in Denver, is surprising. For these centers, the ratio is greater than 1.0, which means that variable costs take up over 100% of all revenues. Since total revenue was supposed to include all income received, it appears that in Denver the profit-making centers were, on the average, taking a loss, and the public centers in both cities were incurring a fairly sizeable debt.

In almost all cases, variable costs absorb most of the revenue brought into centers. This is due largely to the large percentage of total revenue that is made up of salaries and wages. Overall, 70% of the total revenue in Seattle and 66% in Denver is directed toward wages and salaries.† However, these percentages varied considerably according to proprietary type. In both cities, the private for-profit centers spent a relatively small percentage of their revenue on wages and salaries (less than half in both Seattle and Denver); on the other hand, the public centers in Seattle spent almost all their revenue on wages and salaries, and in Denver it was four-fifths. Nonprofit private centers had a somewhat lower percentage of revenue going to wages and salaries than public centers, but the percent so spent was still far above (about three-fourths in either city) those of the profit-making groups.

We can also estimate the effect on the center's wage bill if the minimum wage in effect on May 1, 1974, were to be paid by all centers. Table 25 summarizes the results of that calculation. On the average, centers would find that imposition of the minimum wage would raise their

---

*This is calculated by adding one-half the total of children enrolled part time to the total of children enrolled full time.

†If fringe benefits are included, this is higher by about 4% to 5%.

Table 25

EFFECT OF ENFORCEMENT OF THE MINIMUM WAGE[a] ON CENTER WAGE BILL

	SEATTLE				DENVER			
	All Centers	Nonprofit		For Profit	All Centers	Nonprofit		For Profit
		Private	Public	Private		Private	Public	Private
Number of deficit[b] employees	30	20	4	7	50	9	11	30
Additional annual wage needed for deficit workers[c]	$14,975	$10,491	$1,877	$2,607	$26,509	$2,378	$3,712	$20,628
Total number of past employees	283	175	52	56	302	82	150	70
Average hourly wage of all paid employees	$2.715	$2.702	$3.183	$2.326	$2.621	$2.451	$2.946	$2.125
Total annual wage bill for all paid employees[d]	$897,427	$552,289	$193,323	$152,139	$924,521	$234,747	$516,139	$173,740
Percent that added wage is of total[e]	1.7%	1.9%	1.0%	1.7%	2.9%	1.0%	0.7%	11.9%

[a]The minimum wage for newly covered workers (effective May 1, 1974) was used, which was $1.90 per hour.

[b]A deficit worker is a regularly paid employee who earned less than $1.90 per hour during the survey week in May 1974. The number of deficit workers actually found in the survey of regular paid employees was adjusted, by the inverse of the proportion responding to the staff questionnaires, to estimate the total number of deficit employees among all regular paid workers. The inverse of the proportion responding was 1.7857.

[c]The additional annual wages needed for deficit workers was computed by adding the amounts that would be needed in order to bring all deficit workers up to the minimum wage level, and then multiplying that total by the estimated average number of hours worked per year (1,168). The estimated annual hours was derived by assuming that paid employees worked an average of 40 weeks per year. That figure was then multiplied by 29.2, which is the average hours that regular paid employees worked during the survey week.

[d]This is the product of line 3 multiplied by line 4 of the table, and the sum multiplied by the estimated annual hours of work (1,168).

[e]Line 2 divided by line 5, and the result multiplied by 100.

wage bill by from 2% to 3%,* except for the private for-profit centers in Denver. In those cases, the wage bill would increase by almost 12%.

We were also able to estimate the current market value of equipment and vehicles in the Seattle and Denver day care centers. (See Table 26.) In Denver, we find that the for-profit centers make a substantially higher outlay on equipment and vehicles than do either of the nonprofit types. However, this is due largely to the much higher value of vehicles owned by the profit-oriented centers. Taking only the ratio of the current market value of equipment to the number of currently enrolled children in Denver, we find that the profit-making centers make an expenditure on equipment per child about equal to the public centers. This is still quite different from what we see in Seattle, where public centers have a far larger investment in equipment plus vehicles per child, as well as in equipment alone, than do either the profit-making or the private nonprofit centers. We also found that the current value per child of these items was greater in Seattle than in Denver, although the for-profit centers in both cities had approximately equal values for equipment per child.

Another cost issue is the provision of transportation services to users. Very few of the unlicensed FDCH vendors in either city provided such service, about 7% in Seattle and 3% in Denver. Of those that did in Seattle, most charged extra for that service; of the few who provided transportation in Denver, almost all said that they did not alter their fee for this additional service.

Of the licensed FDCHs in Seattle, about a tenth provided transportation to and/or from the home for the children under their care. In about three-fourths of these cases, the fees paid did not include a charge for this service, so that when transportation was provided, an additional assessment was made. In Denver, almost none of the licensed FDCHs offered a transportation service.

---

*The percent change in Table 25 is more meaningful than the absolute amounts, since we did not receive the necessary data from about half the regular paid staff in centers.

Table 26

CURRENT MARKET VALUE OF EQUIPMENT AND VEHICLES
(Means)

Current Market Value	SEATTLE All Centers	SEATTLE Nonprofit Private	SEATTLE Nonprofit Public	SEATTLE For Profit Private	DENVER All Centers	DENVER Nonprofit Private	DENVER Nonprofit Public	DENVER For Profit Private
Equipment and vehicles	$5,320	$4,742	$6,849	$5,577	$4,789	$2,460	$4,221	$7,157
Equipment and vehicles/ currently enrolled child	126.97	102.86	231.38	135.69	79.68	45.30	70.47	110.79
Equipment/currently enrolled child	97.33	87.55	210.07	74.94	61.61	30.94	70.42	72.34

6-A

In Seattle, about a quarter of all centers provide transportation to and from their facility, with about half of these adding an extra charge for this service to their regular fee. The percentage providing transportation in Seattle ranged from 33% of the for-profit and public centers to about 17% of the private nonprofit centers, with none of the public centers including the cost of transportation in the fees charged. In Denver, less than 10% of all centers (none of the private nonprofit centers) provided transportation, with about 6% of the public and 18% of the for-profit centers doing so.

In another paper [26], we found that the annual cost per currently enrolled child in public centers* was from 2-1/2 to 4 times higher than for other center types in Seattle and from 2 to 3-1/3 times greater for the other proprietary types in Denver. From the data collected we have determined that the cost discrepancy was due to three main factors: (1) a lower average ratio of children to staff in public centers, (2) a somewhat higher average number of hours worked per week by public center employees, and (3) a much higher average hourly pay received by public center employees. So we find that, for a given number of children, public centers used more paid help, and they were paid a larger amount for more hours worked. Moreover, it is well to remember that these factors may also be indicative of a higher quality of care.

So far in this chapter on cost, we have been concerned with descriptive analysis of the cost data from our survey. Now we want to investigate estimated cost functions, from which we attempt to isolate the cost of custodial care.

Cost Functions--An Attempt to Isolate the Cost of Custodial Care

Estimating a cost function for day care is complicated by the nature of the output. One of the simplifying assumptions usually made

---

*It was found to be $1,960 in Seattle and $1,644 in Denver.

in the study of cost functions is that outputs are homogeneous between firms. While this is never strictly true, the assumption is a reasonable abstraction from reality in many situations. Unfortunately, day care is not one of these. Comparisons of the amount of service produced by different day care providers fail to capture important differences in quality of service. The costs of day care vary significantly in relation to quality as well as amount of care. Correctly accounting for differences in quality is complicated by the fact that there is no general agreement on what it is. Other studies of day care costs [1], [27] have avoided the difficulty by simply equating quality and cost. For a given quantity of care, they have assumed that differences in costs reflect equivalent differences in quality.

The cost functions estimated in this section reflect a different approach. We have calculated a charge for each child for a standard 40-hour week of service. We assume that on a weekly basis, the relationship between the charge and the quantity of care is proportional, e.g., that the charge for two weeks of care is double that for a single week. To account for differences in quality, we include variables in the cost function that should affect that dimension of care. This approach does not result in an explicit relationship between day care quality and cost. However, the goal of this section is to produce a cost function that will be a useful tool in evaluating the feasibility of day care subsidization. Moreover, public policy may be confined, in a comprehensive national day care subsidy program, to subsidizing only the basic custodial component of day care. Our approach does make it possible to estimate the cost of custodial care--that is, day care approximating the care provided by the mother herself. The idea of quality in day care, and the rationale for our choice of indicators of quality, are discussed in Appendix F.

In explaining the variation in the weekly charge, the most important indicator of quality is the amount of the provider's labor available to each child. Labor is, in value terms, by far the most important input. It is the only provider input to in-home care. While

additional inputs are used by other types of providers, even in child care centers (which should use the greatest number of additional inputs), wages and benefits equal about 75% of gross income. Thus the relationship of labor input to the charge per child is central to the cost function for day care.

Since the model seeks to explain the variation in the charge per child for a fixed period of care, the relevant amount of labor input can be represented by the ratio of children to providers. This ratio decreases as the attention given to each child increases, and vice versa. The exact relationship of this quantity to the charge per child is not immediately obvious. At one extreme, the charge per child may be determined independent of the ratio of children per provider. All variation in the charge may be explained by the quality of the labor input and the amounts of other inputs.

At the other extreme, an argument can be made that it is the total charge for a provider's service rather than the charge per child that is determined by the quality of the service and the quantity of other inputs. If the number of children to be cared for is not large, the addition of another child should not greatly increase the effort required of the provider. That implies that over some range of the number of children per provider, the total charge should be approximately constant for a given provider's service. Such a relationship seems most probable for in-home providers. Since the total charge is the product of the charge per child and the ratio of children to providers, this relationship implies that the charge per child should be inversely proportional to the child/provider ratio. These two possible relationships between the charge per child (C), the child/provider ratio (R), and the variables representing quality of service and amounts of other inputs (Q_i) can be represented by the equations

$$C = a + \sum_i b_i Q_i \qquad (1)$$

$$CR = d + \sum_i e_i Q_i \; . \qquad (2)$$

Equation (2) can also be expressed as

$$C = \frac{d}{R} + \Sigma e_i \frac{Qi}{R} . \qquad (3)$$

The true function is likely to be somewhere between the two extremes and some experimentation has led to an intermediate model of the form

$$C = f + \frac{g}{R} + \Sigma h_i \frac{Qi}{R} . \qquad (4)$$

The model in (4) requires the child/provider ratio as a variable, but the nature of child care service makes it difficult to define a single child/provider ratio. The number of children cared for in any time period of reasonable length may vary for a number of reasons. Parents' differing needs, or children's illness or school attendance, may cause substantial variations in the number of children present in a day care facility at any particular time. In addition, the number of children enrolled may not be the number preferred by the provider.

Differences between the actual and the desired child/provider ratio may effect the charge per child. Two providers, equipped to handle the same number of children, may charge differently if their average attendance is different. The provider with lower average attendance would wish to charge a higher hourly rate for part time children to maintain his hourly wage, and parents may be willing to pay a higher rate because they purchase essentially a lower child/provider ratio. Thus, we hypothesized that if differences in attendance caused any variation in the charge, increases in the average proportion of children in attendance to the number regularly enrolled would decrease the charge. To capture this effect, the ratio of average attendance to maximum attendance was included as an independent variable.

Specifications of Variables

The variables needed for estimating Equation (4) are presented systematically in Appendix F; here we briefly summarize them. The dependent variable, charge per child (C), has been constructed so that it reflects a normalized 40 hours of use per week. The child/provider ratio (R) is simply the number of currently enrolled children per provider. The other variables represented other inputs used to produce day care services, other services provided in conjunction with day care, and differences in quality between providers.

Cost Equations and the Estimation of Custodial Care for In-Home and Family Day Care Home Providers

Estimates of the model given in Equation (4) are presented in Table 27. These represent the combined regressions* separated by city and provider type.

Custodial care must be defined in terms of specific values of the independent variables in the regressions reported above. The values we have chosen to represent the custodial level of care for the variables used in those regressions are shown in Table 28. Summed, they add $7.60 to the equivalent wage in Seattle and $4.96 in Denver. None of the extra services were included in custodial care and only two quality variables were given nonzero values. Using an appropriate data base from another study [11], we found that the average education of lower income working women was approximately 12 years in Seattle and 10 in Denver. We felt that custodial care should approximate the care provided by the mother, at least in terms of quantifiable measures, and this led us to choose 12 and 10 years of education as the amounts appropriate for custodial care. The PREWORK dummy was set to 1 because it seemed likely that lack of previous work experience might indicate a provider who is reluctant to work and insists upon a higher-than-normal

*See Appendix F, Table F-1, for the overall combined regression.

Table 27

COMBINED REGRESSION SEPARATED BY CITY AND PROVICER TYPE[a]

Seattle

In-Home Providers

CR = 64.03 + 5.19 R - .57 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK + 1.38 HOME - 13.25 CENTER + .06 PCTDEVL
+ 22.21 SBL - 3.13 COOK + 19.41 LAUND - 7.46 OVRNT

Unlicensed Family Day Care Homes

CR = 58.29 + 13.24 R - .48 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK - 4.81 INHOME - 13.25 CENTER + .06 PCTDEVL
+ 22.21 SBL - 7.46 OVRNT

Licensed Family Day Care Homes

CR = 48.71 + 20.98 R - .69 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK - 4.81 INHOME - 13.25 CENTER + .06 PCTDEVL
+22.21 SBL - 7.46 OVRNT

Denver

In-Home Providers

CR = 105.01 + 5.19 R - 1.02 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK + 1.38 HOME - 13.25 CENTER + .06 PCTDEVL
- 9.51 DBL + 2.12 DCH - 3.13 COOK + 19.41 LAUND
- 7.46 OVRNT

Unlicensed Family Day Care Homes

CR = 58.29 + 13.24 R - .29 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK - 4.81 INHOME - 13.25 CENTER + .06 PCTDEVL
- 9.51 DBL + 2.12 DCH - 7.46 OVRNT

Licensed Family Day Care Homes

CR = 31.46 + 20.98 R - .59 PCTCHLD + 1.32 EDUC + .03 EXPER
- 8.23 PREWORK - 4.81 INHOME - 13.25 CENTER + .06 PCTDEVL
- 9.51 DBL + 2.12 DCH - 7.46 OVRNT

---

[a]See Appendix F for definitions of variables.

wage. Although we used a value of zero for the experience variable, the coefficient is so small that the choice of any reasonable value for the variable would cause very little change in the cost of custodial care.

Table 28

VALUES OF PARAMETERS FOR CUSTODIAL CARE

Variable[a]	Seattle	Denver
OVRNT	0	0
COOK	0	0
LAUND	0	0
EDUC	12	10
EXPER	0	0
INHOME	0	0
HOME	0	0
CENTER	0	0
PREWORK	1	1
PCTDEVL	0	0

[a]See Appendix F for explanation of variables used.

Substituting the values in Table 28 into the cost equations yields the equations in Table 29. It should be noted that the coefficients of the child/provider ratio are constrained to be equal across cities for each provider type and the race variables are constrained to be equal across provider type for each city. Despite the constraint on the child/provider ratio, the two unconstrained variables--the constant and the PCTCHLD, the variable measuring the ratio of average attendance to the maximum--have the same relationship between provider types for each

city. Thus, for each city, in-home providers have the largest constant and licensed family day care homes the smallest. A similar relationship holds for PCTCHLD. The consistency of these results for both cities supports the validity of the constraint on the coefficients of the child/provider ratio across cities.

Table 29

REDUCED CITY/PPOVIDER TYPE REGRESSIONS

City and Provider Type	Equation
Seattle	
In-home	CR = 71.62 + 5.19R - .57 PCTCHLD + 22.21 BL
Unlicensed FDCH	CR = 65.88 + 13.24R - .48 PCTCHLD + 22.21 BL
Licensed FDCH	CR = 56.30 + 20.98R - .69 PCTCHLD + 22.21 BL
Denver	
In-home	CR = 109.96 + 5.19R - 1.02 PCTCHLD - 9.51 BL + 2.12 CH
Unlicensed FDCH	CR = 37.96 + 13.24R - .29 PCTCHLD - 9.51 BL + 2.12 CH
Licensed FDCH	CR = 36.41 + 20.98R - .59 PCTCHLD - 9.51 BL + 2.12 CH

The coefficients of the child/provider ratio and PCTCHLD are significant against zero in most cases. Only for in-home providers is either not significantly different from zero at the 5% level. Thus, for all family day care homes, the hypothesis that the provider's wage does not depend upon the number of children in his care can be rejected.

The calculation of the cost of custodial care for each city and provider type requires the choice of values for PCTCHLD and the child/provider ratio. For each city and type, providers were found whose average attendance was equal to their maximum. Thus, a value of 100%

for PCTCHLD was chosen as appropriate for custodial care. The number of children per provider was found to be as high as 12 in some family day care homes. This ratio seems to be too high to ensure adequate custodial care. Both cities have regulations imposing a maximum of six children per adult in family day care homes, which seems to be an effective limit. Less than 7% reported averaging more than six children per provider. Because it was an effective limit for most firms and because it seems a reasonable maximum to ensure adequate custodial care, a child/provider ratio of six was used in calculating the charge for custodial care for family day care homes. Neither Seattle nor Denver regulates in-home providers, so there is no established maximum child/provider ratio for this type of day care. However, the six-to-one ratio for family day care homes seems a reasonable maximum for these providers also. We observed only one provider in either of the two cities who had a higher child/provider ratio. Substituting these values for PCTCHLD and the child/provider ratio yields the estimates of the cost of custodial care shown in Table 30.

Table 30

COST PER CHILD FOR CUSTODIAL CARE
(White Provider, R = 6, PCTCHLD = 100)

	In-Home	Unlicensed FDCH	Licensed FDCH
Seattle	7.63	16.22	18.86
(Black provider)	(+3.70)	(+3.70)	(+3.70)
Denver	6.52	14.73	17.22
(Black provider)	(-1.59)	(-1.59)	(-1.59)
(Chicano provider)	(+.35)	(+.35)	(+.35)

The estimated charges for custodial care are consistent across provider types for each city. For neither city is the difference between licensed and unlicensed family day care homes large. There is

a sizable difference between the two types of family day care homes and in-home providers, but this may be a consequence of the way the results are presented rather than a true difference between the provider types. In-home providers typically care for the children of only one family, while family day care homes may have children from several different families. Thus a three-child family must accept a child/provider ratio of three if the parents hire an in-home provider but can get a child/provider ratio of six in a family day care home. The relevant costs for in-home care for a three-child family are $29.06 in Seattle and $41.84 in Denver per child. The costs for care in a family day care home are shown in Table 30. The conclusion to be drawn from Table 30 is that in-home care is less expensive than other comparable care but it is not a cheaper alternative for most users.

Differences in cost may also be a result of differences in services provided. We have not been able to account for capital services in establishing the cost function. Capital costs seem unlikely to be a major part of the charge, but they may explain some part of the difference between the two modes of care.

Cost Equations and the Estimation of Custodial Care for Centers

The estimated combined regression for both cities is presented in Table 31. A discussion of the sample size problem as well as the individual coefficients are given in Appendix F. Here we want to use the estimated regression to determine the cost of custodial care for centers.

Values for some of the independent variables in the regression that are appropriate for custodial care are given in Table 32. The values for the mean education level are taken, as for the in-home providers and family day care homes, from data from a sample of low income families. The racial variables represent the racial composition of providers with whom the average child came in contact. Note that, as in the previous regression, the variable for Chicanos has been

Table 31

DAY CARE CENTER REGRESSION

Dependent variable: Charge per child

	Coefficient in $ (standard error)
Independent variables	
1/R	-3.25 (3.16)
SEATTLE	.25 (1.20)
AGE	.22 (.13)
EDUC	1.77[b] (.65)
EXPER	-.65 (.42)
PCTDEVL	.04 (.05)
PROFIT	2.86[b] (1.25)
PUBLIC	4.64 (2.54)
BLACK	2.10 (2.50)
CHICANO	11.08 (9.97)
CAPITAL	.0004 (.003)
SUBSIDY	-.11 (.09)
Constant	-15.24 (12.07)

Number of observations: 87

R^2 = .70

Standard error: 31.75[c]

---

[a]Charge per child for centers was calculated from a charge schedule rather than from actual charges, as was done for other providers. The calculation is described in Appendix F. The values of the dependent variable are strongly affected by the way in which the calculations were done.

[b]Significantly different from zero at the 5% level.

[c]The regression was weighted by the square root of the number of children in the center. Thus the standard error applies to the product of the charge and the square root of the number of children. Since the mean value of the square root is 6.63, this standard error is equivalent to a standard error of approximately $4.79 on the charge itself.

DEFINITIONS OF REGRESSION VARIABLES FROM TABLE 31

Variable	Definition
C	Charge for a 40-hour week of care
R	Child/provider ratio
SEATTLE	Dummy indicating a center in Seattle
AGE*	Mean age of providers in center who responded to survey
EDUC*	Mean number of years of education of providers who responded to survey
EXPER*	Mean number of years of experience of providers who responded to survey
PCTDEVL*	Average percent of time spent in developmental activities by providers who responded to survey
PROFIT	Dummy indicating for-profit center
PUBLIC	Dummy indicating center run by public agency
BLACK	Proportion of Black providers among survey responders
CHICANO	Proportion of Chicano providers among survey responders
CAPITAL	Market value of all capital equipment used by center except buildings and grounds per child
SUBSIDY	Value of direct subsidies to center for previous year per week per child

*The data from which the variables AGE, EDUC, EXPER, and PCTDEVL were calculated came from a questionnaire distributed to individual providers in the center. Not all questionnaires were returned, so these variables were averages based on sometimes partial information.

suppressed in Seattle. The custodial level of capital per child and the average age of providers are arbitrary numbers, substantially below the average for all centers. The custodial level of the child/provider ratio was taken to be six. We did not believe that the maximum level for the number of children per provider would differ greatly between provider types and so the level for centers was chosen consistent with other provider types. Finally, a value of one year was chosen for the variable measuring the average experience of providers as a practical lower limit for that variable. Table 33 presents charges for custodial care based upon the values in Table 32 for both cities and each of the three types of centers.

Table 32

VALUES OF PARAMETERS FOR CUSTODIAL CARE

Variable	Value for Seattle	Value for Denver
C	1	1
1/R	1/6	1/6
Seattle	1	0
AGE	25	25
EDUC	12	10
EXPER	1	1
PCTDEVL	0	0
PROFIT	-	-
PUBLIC	-	-
BLACK	.163	.193
CHICANO	-	.043
CAPITAL	150	150
SUBSIDY	0	0

Table 33

COST OF CUSTODIAL CARE IN DAY CARE CENTERS
(Dollars/Week)

	Seattle	Denver
Private nonprofit centers	10.98	7.37
Public nonprofit centers	13.85	10.21
Private profit centers	15.62	11.98

As for the other provider types, care in a day care center is more expensive in Seattle than in Denver. Unlike the case with in-home providers and family day care homes, the difference in cost between the cities arises directly from the different levels of education required rather than from differences in the cost relationship.

These estimates of the cost of custodial care place centers between in-home providers and family day care homes in both cities. For the reasons discussed above, a comparison with the cost of custodial care for in-home providers is not justified. In-home providers have essentially a different service from the two other provider types. A comparison between centers and family day care homes is appropriate, however, and that comparison indicates that centers are somewhat less expensive than family day care homes. Since the greatest difference between the two modes is in the average size of their operations, this may indicate the presence of some economies of scale in child care. Centers may benefit from greater specialization or better organization than is possible in family day care homes. However, the difference in costs between the two types is not large enough to support any firm conclusions about their relative efficiency. Also, the superiority

of private nonprofit centers to the other types is even more striking when a comparison is made with family day care homes. Both of these results raise interesting questions for further research.*

*An attempt to compare these costs with an independent assessment of total cost per child was made, but differences in the data base for the two estimates made that comparison unreliable. Essentially, the cost function was estimated from data on charges (revenue data), while the other cost estimate was based on actual costs (debit data). Moreover, the actual cost data used is deficient in several respects, especially with regard to capital costs.

Appendix A

DAY CARE SURVEY

Introduction

In a survey operation we rarely have the resources to undertake both an extensive and an intensive investigation. The Abt study [1] was an in-depth, intensive look into a handful of high-quality center operations, whereas the Westinghouse-Westat study [27] provided a broad, extensive review of a large number of day care operations. In the former, we can get at details, such as the provision of "in-kind" services or the relationship between day care operations and tax write-offs. Such detailed data can rarely be obtained in the survey attempting to obtain a broader coverage. In that case, researchers are confined to a broader set of generalizations, many of which cannot be answered with a small set of detailed data. When budgets are restricted, what is chosen depends on the research design and the questions that that design elicits [19].

We attempted to gain greater depth than the Westinghouse-Westat survey, yet also provide a much broader coverage than the Abt survey. However, our survey was not as extensive as the former, nor nearly as intensive as the latter. Our compromise did, however, provide us with detailed data on a large enough sample that we can obtain reliable estimates of some important supply relationships in the Seattle and Denver day care industry.

Our preliminary review of the day care industry indicated that it was composed of three main sectors: centers, family day care homes (licensed and unlicensed), and in-home providers. Three basic survey instruments were developed to obtain the needed data from those three day care sectors. The instruments were designed so that we would get needed details, yet be short enough to allow us, within the budget

constraint, to obtain enough coverage of the industry. Before proceeding with a review of the content and purpose of the instruments used, we will discuss the sample selected for the day care survey.

Sample Selection

Our sample selection was based on estimates of the population in the different sectors of the industry, along with the budget limitation for the survey. Estimates of the population of centers and licensed family day care homes (FDCH) in both Seattle and Denver are very reliable, although there is a significant turnover in the latter sector. However, the size of the informal sector, unlicensed FDCHs and in-home providers, is difficult to estimate with any reasonable degree of reliability. Our estimates of the informal sector could easily be double or only half the true population size.

There were 74 eligible centers within the city limits of Seattle and 50 in Denver. All centers were to be included in the survey. There were seven complete refusals (about 10%) in Seattle and three refusals (about 6%) in Denver. Consequently, we were able to obtain 65 completed center interviews in Seattle (along with two partial interviews) and 47 completions in Denver.

Our SIME/DIME state liaison people gave us current lists of (almost) all licensed FDCHs in Seattle and Denver. From that list we selected a 25% random sample of the population to be surveyed. The refusal rate in this sector was almost 10% in Seattle and 1% in Denver. The total of licensed FDCH questionnaires completed was 214 in Seattle and 167 in Denver. Of the latter number, 17 had been classed as unlicensed FDCHs in a presurvey listing. During the interviews, and through a later check, it was found that these homes were actually licensed. They were consequently placed in the licensed FDCH sample.

For the informal sector, our goal was a sample of 200 unlicensed FDCHs and 75 in-home providers in Denver, and 225 unlicensed FDCHs and 125 in-home respondents in Seattle. Our very crude estimate of the informal sector suggested that, overall, the sample size chosen would

represent between 5% and 10% of the total population. However, due to the difficulties in contacting and interviewing respondents in the informal sector, we were able to obtain only 27 completed unlicensed FDCH and 25 in-home interviews in Seattle, and 104 unlicensed FDCHs with 20 in-home completions in Denver. In Seattle there may simply be a smaller population of unlicensed FDCHs because of the more rigidly enforced licensing requirement. On the other hand, it is equally likely that, due to the stringent legal considerations, the (illegally) unlicensed FDCHs are more hesitant about revealing that condition. Although there is also a legal requirement that FDCHs be licensed in Denver, the law is not enforced as rigorously there as it is in Seattle. For the in-home providers, we estimate that our sample of completions represents (roughly) perhaps 1% of the total population.

The informal sector sample was selected through several sources. First, we sent a letter to all SIME/DIME families asking them to return an enclosed form with the name of any child care provider they used or knew. All licensed providers (centers and FDCHs) were eliminated from the names returned.* The remainder were contacted for inclusion in the survey. We also obtained the names of some informal sector providers through the welfare department in Seattle and Denver.

Content of Instruments Used

The instruments were designed to obtain the data needed to answer research questions arising from our a priori models of the day care industry. These questions involved such issues as costs, product differentiation, and entry barriers, brought out in Part I of the report.

In order to address the research objectives of this study, seven principal areas for data needs were developed. These seven areas

---

*The sample generated from the SIME/DIME population, which is a random selection from the lower income families in the overall population of Seattle and Denver, is somewhat biased. However, our concern is primarily with the supply of day care for lower income families, so the bias is not an important problem for our analysis.

concerned output, revenue, capacity and waiting lists, entry barriers, information, costs, and social and demographic characteristics of providers and children using day care services.

As a measure of output, ideally we would prefer to isolate custodial care from the educational-developmental components of day care service. In an attempt to do that, the instrument was structured so that data on specific activities undertaken by providers would be collected. On the basis of discussion with day care specialists, we then determined which of those activities were relevant to the provision of purely custodial service, which to the provision of educational-developmental services, and which to other administrative or nonchild care services. Data were also collected for use in an alternative method of determining the custodial component of day care. That data involved information on prices and on physical services such as meals served, health checkups, whether the illness of a child precludes day care utilization, and whether parental guidance is offered. Furthermore, the relationship between the price charged per child and the number of children per provider, or staff member, in the three main sectors, might provide us with an alternative measure of custodial care (see Part V).

Revenue estimates were generated from data collected on fees, subsidies, and donations received. There are also data available on gross earnings and the total number of children cared for. The fees are given for each child for in-home and FDCH providers, whereas a fee schedule is provided for centers. Data are also available on non-child care duties, such as light housekeeping performed by in-home providers in the day care user's home, for which a fee adjustment must be made.

Capacity data are available in terms of the hours and days the facility is open, the number of full- and part-time children in attendance, and whether there is a waiting list for available slots.

For entry barriers, we have data on problems associated with licensing and zoning, where variances are required. In addition, we

know the delays encountered in receiving the license or in obtaining the zoning variance. Data were also collected on the changes required to obtain the license; furthermore, some data are available, or can be estimated, on the capital needed to start up a day care operation.

Information data are chiefly concerned with how the user finds out about the service available, as well as how the provider communicates that information.

Cost data are most important for our analysis of the day care industry. Because of its importance, and the difficulty of getting reliable and comprehensive cost data, a significant proportion of the interview was devoted to collecting information regarding costs. Our concern was not only to obtain actual cost data on all relevant inputs, but also to get information that would allow us to impute costs for volunteer services, and for donated foods, materials, equipment, rent, and so on. Not only did we obtain data on the actual or imputed costs of many inputs, but we also received the information needed to translate these costs into current dollars.

Finally, we obtained data from the interview on many of the social and demographic characteristics of providers and children. Data on the age, sex, race, and relationship to provider are available for providers and children. Additional data on education and work experience are also available for providers. For center staff, there are also data on whether the staff member works, and whether the fees for their own child are adjusted because of their working at the center.

The interview instruments were structured to get the data needed to address the research issues presented above. However, as our brief discussion of the seven content areas indicates, a lot of data were needed. After extensive cutting following a pretest, the interview turned out to be about an hour long, and some problems arose in carrying it out. It is useful to look at some of these problems as they affect the data collected.

Problems in Data Collection

Interviewing began on May 2, 1974, and ended, with the exception of a few hard-to-reach cases, by June 7, 1974. In almost all instances, this meant that the interviews were conducted during the regular school year. For both sites and in all sectors, the refusal rate was below 15%. If the rate had exceeded 15%, we planned to obtain a profile of respondents who refused to be interviewed to see whether there was a systematic difference between those who provided the information and those who refused. Since the refusal rate was, in most cases, far below our cutoff point, the refusal profile was not undertaken.

Another problem was that in Denver the list of licensed FDCHs was not complete, in that anyone who did not want his name to be used in any referral would not be placed on the list compiled for use by referral agencies. Since that was the list we used to determine the total population of licensed FDCHs in Denver, we did not have an accurate tally. However, a relatively small number of all licensed FDCHs refuse to be listed. But when we selected our sample of unlicensed FDCHs, 17 were, during the course of the interview, found to be licensed. This usually came to our attention when the unlicensed FDCH respondent would answer "yes" to question 501 ("are you licensed by an agency of the city or state as a family day care home operator"?). For those who were later confirmed to be licensed, we changed their ID number to reflect their actual condition, thereby placing them in the licensed FDCH sample. The same problem did not exist in Seattle since all licensees are on the list supplied by the Department of Social and Health Services.

There were a number of other general problems that arose during the course of the interviews, as well as some important problems relating to specific questions. One major problem was, as pointed out previously, obtaining an adequate sample of in-home providers in each city, and a large enough sample of unlicensed FDCHs in Seattle. In our attempt to enlarge the sample of unlicensed FDCH operators, we came across a large number of communal child care exchanges. Due to

the peculiarities of this class of child care providers,* they were not included in our sample.

Several problems arose during the center interviews. One was outside our control--the fact that in Seattle some centers had participated in three surveys during the two years preceding our survey, including one that began a few weeks before ours. About twelve centers were involved in the latter survey, with two refusing our attempts to interview them. Another center problem concerned the interview length. Although we tried to cut down the average on-site interview time to a maximum of 1-1/4 hours, we found that the time required was running from 15 to 60 minutes longer than our maximum. The interviewers reported that the early respondents would become irritated when the interview went much beyond an hour, and would hurry through the last section. Since much of our needed cost data were being picked up at the end of the interview, we felt that it was essential to cut down the time. To do that, we eliminated ten questions that had to be answered by the respondent, usually the director, for each staff member employed at the center. These questions took a large amount of time since some centers had as many as 30 staff members, and few had less than five. Moreover, the ten questions removed concerned the position for which staff members were originally hired, the number of people hired for that position in the past year, and the time required recruiting for that position. These questions were originally included in order to obtain some information on possible "rare" inputs that could, conceivably, be a significant cost factor. Since the directors were having great difficulty in answering those questions for their staff, and since the time required in trying to obtain that data was jeopardizing more important data, the ten questions were removed from the on-site interview instrument.

There was also a supplement left behind at the center interview, to be distributed to each center employee. After completion of her

---

*This appears to be more related to a type of living arrangement, rather than to the market supply of day care services.

individual supplement, the staff member was to seal the form in an enclosed envelope and return it to the center director, who was to forward all staff supplements to the Urban Opinion Survey office. Although a large number of these staff questionnaires were returned, there were a significant number that were not returned, or not returned in time for inclusion in our files.

Concerning the staff questionnaire that was left behind by the interviewers, perhaps the most serious problem was the grid specifying the activities undertaken during a week. This same difficulty was also found during the FDCH interviews. The key problem was, as we anticipated, division of the working week into independent activities. As one respondent put it, "The various duties and periods cannot be divided into hours and minutes and the harder my staff tried the more frustrating it was for them. Periods, duties and activities overlap and very often many things are taking place at the same time." This is clearly true, but the overwhelming proportion of all respondents were able to fit their activities by time into major activities undertaken. Where problems were found in the activity grid and elsewhere in the returned staff supplement, we found it difficult to follow up with the respondent. This resulted from the fact that most of the center interviews were done in late May and early June. By the time the supplements were sent in, many of the staff members had left on vacation, especially volunteers, and locating them was not possible. Moreover, many directors simply refused to have staff members called to the telephone for follow-up work.

Another problem area was in fees that were scaled to family income. In some cases there were almost 50 income classes used! Where the center could not constrain the fees within a more manageable number of income classes, we averaged the fee schedule into at most five income classes for nonsubsidized child care users.

Still another problem that arose concerned some confusion with regard to out-of-pocket food expenditures. In one question we asked, "On the average, how much do you usually spend per month on food for

the children, other than your own?" In a set of related questions, we asked whether food stamps had been used to purchase food for children who were cared for for pay, as well as the amount actually paid for those food stamps. We found that some interviewers were adding the sums from the several questions while others were not. In order to obtain an accurate measure of the actual out-of-pocket expenditures, we checked back with all respondents whose answer to the set of food expenditure questions indicated a possibility that the data given might have been included twice.

A major source of cost data for FDCHs (licensed and unlicensed) came from a set of questions concerning capital and equipment owned. To compare the asset positions of FDCHs with similar homes in which child care is not provided, as well as to compare the asset positions of FDCHs with centers, a bifurcation of our FDCH sample was required. One subsample of FDCHs (licensed and unlicensed) was administered the same capital and equipment questions asked of all centers; the other subsample of FDCHs was asked the Net Worth module as given in the 7th SIME/DIME Periodic interview. A comparison of the FDCHs given the Net Worth module with homes of comparable socioeconomic characteristics that do not provide day care services was then made. Using a regression model, we determined whether additional capital assets were needed by FDCH operators, because of their child care activities.

Appendix B

TESTS OF RANDOMNESS OF RETURNED STAFF QUESTIONNAIRES

SEATTLE (N = 67)

	Proportion of Regular Staff Returning Questionnaires		Chi Square Level of Significance
	Less than 25%	25% or more	
Proportion of enrolled children who are aged 2-5			
Less than 70%	22.2	77.8	0.229
70% or more	38.7	61.3	
Number of children currently enrolled			
40 or fewer	35.9	64.1	0.314
41 or more	21.4	78.6	
Proportion of currently enrolled children who are full time			
75% or less	26.2	73.8	0.567
76% or more	36.0	64.0	
Total number of people working in center, paid and unpaid			
20 or fewer	31.0	69.0	0.884
21 or more	22.2	77.8	
Center provides dental checkups (percent)			
Yes	16.7	83.3	0.451
No	32.7	67.3	
Center provides psychological tests (percent)			
Yes	50.0	50.0	0.360
No	27.1	72.9	
Ownership type (percent)			
Nonprofit public	27.3	72.7	
For-profit private	42.9	57.1	0.280
Nonprofit private	22.9	77.1	

DENVER (N = 47)

	Proportion of Regular Staff Returning Questionnaires		Chi Square Level of Significance
	Less than 25%	25% or more	
Proportion of enrolled children who are aged 2-5			
Less than 70%	26.1	73.9	0.936
70% or more	20.8	79.2	
Number of children currently enrolled			
40 or fewer	5.6	94.4	0.054
41 or more	34.5	65.5	
Proportion of currently enrolled children who are full time			
75% or less	18.2	81.8	0.357
76% or more	35.7	64.3	
Total number of people working in center, paid and unpaid			
20 or fewer	25.0	75.0	0.894
21 or more	14.3	85.7	
Center provides dental checkups (percent)			
Yes	18.2	81.8	0.952
No	25.2	75.0	
Center provides psychological tests (percent)			
Yes	23.1	76.9	0.725
No	23.5	76.5	
Ownership type (percent)			
Nonprofit public	5.9	94.1	
For-profit private	35.3	64.7	0.098
Nonprofit private	30.8	69.2	

Appendix C

CLASSIFICATION OF HOURS OF CARE

For all providers, and for individual center staff members, we asked that they allocate the total number of hours worked last week as a day care vendor into twenty separate activities. These activities were then grouped into custodial care hours, educational-developmental care hours, administrative hours, and other hours. Our interest was in the first two types of activities. The method used in classifying activities into custodial or educational-development groups was by a consensus of those involved with the analysis of this study, along with discussions with child care experts. The question asked was, "Out of the total time [worked last week], how much time did you spend in each of the following activities?" The following is a breakdown of the activities according to whether they were grouped into the custodial or the educational-developmental set:

Custodial

1. Supervising or watching children while they were having free play time.
2. Supervising or watching children while they were having a nap or rest time.
3. Taking the children back and forth to the toilet, and attending to their personal toilet, including dressing and undressing them, washing them up, etc.
4. Supervising or watching the children while they were watching TV.
5. Supervising or watching while they were having meals or snacks.

Educational-Developmental

1. Teaching or working directly with the children while they were watching TV.

2. Teaching or working directly with the children on science, language, or number skills. (This includes nature studies, reading, writing, learning numbers, counting, handling different quantities through the use of books, audio-visual aids, games, or other aids.)

3. Preparing materials to teach or work with the children on science, language, or number skills.

4. Teaching or working directly with the children on arts, crafts, and music.

5. Preparing materials to teach or work directly with the children on arts, crafts, and music.

6. Teaching or working directly with the children on indoor-outdoor physical activities. (This includes rhythm games, running, jumping, climbing, digging, puzzles, and tinker toys.)

7. Taking the children on field trips, including museums, factories, and nature studies.

Appendix D

DAY CARE COSTS: PREVIOUS STUDIES

Between 1968 and 1972, estimates of the cost of day care services were presented in three major studies [1, 7, 27]. These studies reported widely varying costs per child of day care operations, after adjustment for a comparable reporting date. This Appendix is concerned with those costs, and the problems encountered in developing the estimates. More specifically, it deals with the issues to be faced in reviewing costs from different studies, and the actual costs found in the studies mentioned above.

Issues

Rowe [17] contends that the discrepancies found in the cost estimates presented in his project are based on data used, pricing problems, and quality and "efficiency" considerations. The first two problem areas relate to differences in the definition of terms used in the various studies as well as to lack of agreement on the "units" of service to be used. Moreover, there are regional cost variations and differential inflationary effects that must be taken into account in making a comparison of alternative cost estimates.

Expanding further on the data questions, we find that a major problem is the form in which cost is to be estimated. For example, we could use actual enrollment or average daily attendance. On the other hand, costs per full-time equivalent for a standard 250-day-year and 10-hour-day program might be more relevant. The Abt study found that average daily attendance (ADA) averaged 12% less than enrollment. Their cost estimates are based on ADA. This biases the costs upwards, in comparison with using enrollment, for centers; however it biases the costs downward for family day care homes. The reason for the latter

result is that FDCH mothers take care of their own children, who are not considered to be "enrolled" but are included in determining the ADA. (See Rowe [16] p. 101.)

On the other hand, some estimates are based on the total number of hours the facility is open, in conjunction with the average enrollment. Using facility hours does have the advantage of stating costs per child using the facility for the time that it is available to them. However, it is not an accurate reflection of actual use nor of the costs consistent with that level of use. It seems more appropriate to estimate the costs per child by determining the total costs per day, and then dividing that sum by the number of full time equivalent (FTE) children multiplied by the average hours of day care provided per FTE child. This would give us an estimate of the cost per child hour for the time that the facility is actually being used.

Other data questions to be answered before useful comparisons can be made between alternative cost estimates concern the elements of cost used in the estimates presented. One major problem is that the imputed costs of volunteer service and the value of donated materials, supplies, and equipment are often not included in the cost totals. Moreover, often only recurrent, operating costs are included, while start-up costs as well as prorated shares of long-term investments are not taken into account. In centers, the use of volunteer labor can be a very significant factor in the actual use of resources in child care operations. The Abt study (as reported in Rowe [17, Chap. 8, p. 16]) found that the use of volunteers, unpaid family members, unpaid overtime, gifts, and other donated resources averaged 5% to 10% of total resources used by proprietary centers, and 15% to 25% of resources used by nonproprietary centers.

For FDCHs, an important and often neglected cost is a relevant market assessment of the operator's wage. What is frequently done is to determine an ex post wage by dividing the difference between income and total operating expenses, excluding wages, by the hours spent providing day care services for pay. This procedure would lead to a

zero profit for FDCH operations, but it may not be an accurate reflection of the real costs incurred. The market wage as calculated above does not take into account the fact that most FDCH operators often take care of their own children during the same time they are providing paid care for other children. This unpaid element of day care should be added into the income received before wages, as described above, are calculated. That would help to make the costs comparable for FDCHs in which the operators do and do not take care of their own children.

The issue of pricing problems and differing regional rates of inflation is fairly straightforward. If in one area the price of inputs is systematically higher, comparison of the costs based on data collected in the two areas is not valid. The same holds if two areas for which cost data are being collected are experiencing differential rates of inflation, which will lead to different relative prices for similar inputs.

Table D-1 shows the total payment structure in Seattle and Denver for individuals with a Bachelor's degree* and highlights some of the problems faced in comparing costs where the price of an important input differs between the areas used. Of course, if only the actual salaries differed, and these were known, we could easily make an acceptable deflation of the higher or an inflation of the lower salary by constructing an index based on salaries in one or another of the cities used. However, first of all we rarely have all the input prices for a similar time period in the sites used for collecting the cost data; and second, the table points out the need to take account of nonsalary items in estimating the relative cost in the two cities. For example, in Denver, although salaries are higher, only one semester of partially paid sabbatical is given, whereas in Seattle, a full year of partial pay is given. This must be taken into account, and once it is known it can

---

*To the extent that centers use certified teachers, this structure may actually be relevant to day care costs. The data were taken from "Salary & Fringe Benefits for Teachers, 1972-'73," Research Report 1973-R2, National Education Association, 1973.

handled without too much difficulty. But the next item presents a problem in pricing inputs that would be very difficult to adjust, in order to compare the price of teacher services between Seattle and Denver. We refer specifically to the hospital and surgical insurance paid by the board. Although Denver pays all the cost of that insurance, payment is made only for the teacher, whereas Seattle pays half the cost for the entire family.

Table D-1

PAYMENT FOR TEACHERS WITH A BACHELOR'S DEGREE

	Denver	Seattle
Salary[a] (taken at midpoint of minimum and maximum salaries)	$9,657	$8,176
Sabbatical		
Time granted[b]	1 semester	1 year
Salary received	1/2 of pay	1/2 of pay
Insurance paid by board		
Hospital and surgical	Full[c]	Part[d]
Group life	Full	Part

[a]Per 183-day year in Denver, and 182-day year in Seattle.

[b]Every 7 years.

[c]For teachers only.

[d]For teachers and family.

Quality and efficiency problems are the other issues to be faced in comparing costs from different surveys. Efficiency relates to producing the same services at lower cost, while quality refers to how the output is to be defined. The two are related in that the issue of how much service of a given quality is produced at the least cost, which is the issue of efficiency, is not uniquely defined as long as researchers view day care quality from different perspectives. For example, the Abt study found economies of scale in day care centers. They found that centers with 75 children produced the "same" day care

services at about 10% less than centers with 25 children. This came about mainly through the spreading of administrative costs. However, the Abt investigators contend that large centers are less warm, so that we may not actually be talking about the "same" service. Whether the warmth of service is a relevant element of the quality of care is difficult to say, but it is generally agreed that meeting the emotional needs of the child should be an important factor in determining the quality of child care.

Obtaining an objective measure for the quality of child care services, one that is consistent and agreed upon between different investigators, has been an almost impossible task. [See 4, 5, and 9, Chap. 20; 17, Chap. 8, pp. 1, 10; and 28, p. 53.] As stated in Chapter 2, child/staff ratios are usually used as the most reliable ad hoc measure of quality. However, it was found in a study of selected centers in San Mateo County, California, that, past some point, increased staff size can lead to a lowering of the care provided (Professor Henry Levin, Stanford University, private communication). In that study, it was found that as staff size increases, more time is spent on interstaff communication and interaction, and less on direct contact with children.

The Westinghouse-Westat study attempted to present some objective measures for viewing centers according to the level of child care provided. First they classified centers according to the aims of the programs. (They did not try to determine whether those aims were being met, how well it was functioning, nor the effect of the programs on children being served.) Their division was into type A (custodial), Type B (educational), and Type C (educational-developmental). They then presented a detailed table of characteristics for centers [27, Table 2.1]. Of the 119 characteristics used, very few appeared to show any sizeable differences between Type A and C centers. In most cases, the percentage of A and C centers for which the characteristics were present or relevant was either both high or both low. It is hard to see the relevance of many of the characteristics for a discussion of

the quality of care. There were a few, however, that show some promise for an index of quality. First, only 4% of the Type A centers had such services as physical or dental exams or vision, speech, or hearing tests, while 72% of the Type C centers provided these services. Furthermore, only 5% of Type A centers had any certified teachers on their staff, while 62% of the Type C centers employed such teachers. The ratio of FTE children to child-related staff was 15:1 for the Type A and 6:1 for the Type C centers. Another relevant observation for a discussion of costs was that the average replacement cost of all equipment was $1,786 for Type A and $3,866 for Type C centers (adjusted to 1974 prices).

All these problems affect the costs of child care. At best, what it indicates is that we should be wary of making fine distinctions in comparing the costs of child care as presented in different studies. The costs to be compared should relate to a given level of quality. Making that distinction clear will be an important element of our analysis.

Costs

Table D-2 presents the average costs for child care as determined in the major studies mentioned above [1, 7, 27].

Table D-2

CHILD CARE COSTS FOR CENTERS

	Abt	Children's Bureau[a]	Westinghouse-Westat
Cost/child/year	$2,614	$1,373 Minimum	$ 324 Type A
		2,053 Acceptable	540 Type B
		2,558 Desirable	1,368 Type C
Cost/child/hour[b]	$1.27	$0.67 Minimum	$0.16 Type A
		1.00 Acceptable	0.26 Type B
		1.24 Desirable	0.66 Type C

[a]The Children's Bureau costs were adjusted to reflect price changes between 1968 and 1970-71.

[b]Estimates of the cost per hour were based on an average of 8-1/4 hours per day for an average of 250 days per year.

The Abt cost data were collected for 13 exemplary centers so that, presumably, their cost is for high quality day care service. The Children's Bureau estimate for "desirable" care also represents an attempt to estimate costs for high quality care. The two estimates are very close. However, the Westinghouse-Westat estimate for Type C centers, also supposed to offer high quality service, is only half of what the other studies found for such service. In fact, the cost for what the Children's Bureau considers to be custodial care (Minimum) is slightly higher than the high quality service found in the Westinghouse-Westat study. It is generally felt that the Westinghouse estimates were seriously underestimated, for several reasons. First, the proprietary centers, which made up almost 60% of all centers surveyed, did not appear to include proprietors' income or the labor supplied by unpaid family members into their costs. In general, as the report warns, "No attempt was made to impute the value of donated goods and services or rent free space" [27, p. XIII]. These costs can probably best be used in comparing the relative differences in costs between Types A, B, and C centers. However, even for this the comparison might not be too useful. Type C center costs are more than four times those of Type A, while in the Children's Bureau study, Desirable care costs are less than twice those for Minimum care. From the descriptions given, it appears that Type A and Minimum care should be approximately the same, as should Type C and Desirable care.

However these costs are defined, it appears in all cases that costs are heavily dependent on the amount of labor used and the wages paid. The Abt study has three-fourths of the budget allotted to personnel costs, while the Children's Bureau estimated that over 60% of all costs were for personnel.

Using data collected from 20 exemplary centers offering educational and developmental services, Abt prepared cost estimates for centers with 25, 50, and 75 children in average daily attendance. The costs found were $2,349 per child per year for centers with 25 children, $2,233 per child per year for centers with 50 children, and $2,189 per

child per year for centers with 75 children. This indicates the existence of fairly small economies of scale for high quality centers. However, as the Abt report suggests, those economies may have been more than offset by the loss of "warmth" in larger centers. They also found that the higher cost of smaller centers was due mainly to lower child/staff ratios, and not to higher salaries [see also 17].

Appendix E

CAPITAL COSTS IN DAY CARE HOMES

Capital Costs in Day Care Homes

Capital costs were left out of the cost equation for family day care homes because of the difficulty in determining how much of the services of household capital goods were used in child care. Another reason for ignoring these costs was that the use of household capital goods may not affect the cost of day care. If the capital goods were things that would be owned whether or not the home was used for child care, and if the children only use excess capacity that would not otherwise be used by the provider's family, then competition could be expected to drive the cost of these services toward zero. To test whether capital services increase the cost of family day care home service, it is necessary to measure these services. The only capital services that can clearly be attributed to day care are those of goods owned by family day care home providers and not by otherwise similar households. Thus, a comparison of the household capital of family day care homes with a group of similar homes that do not provide child care offers the best test for the presence of capital as an element of cost in the provision of day care.

The Seattle and Denver Income Maintenance Experiments are a source of data on families suitable for this comparison. The control groups for these experiments differ from the family day care home families primarily in the fact that they do not provide child care. With this comparison in mind, half the family day care homes in each site were asked the same questions about durable goods that are regularly asked the SIME and DIME populations. Both SIME-DIME and FDCH families were also asked the number of rooms in their homes. Although the data are responses to the same questions, they do not represent the same time period for each group. While the Day Care Survey was conducted in May of 1974, the latest SIME

data available were from February of 1973 and the latest DIME data from November of 1973. This difference in dates could make data from the two sources noncomparable. To determine whether this was the case, comparisons were made within the SIME and DIME samples over an equivalent length of time.* These comparisons showed no systematic difference over time, thus validating the use of the earlier SIME and DIME data for comparison with FDCH data from the Day Care Survey.

Another difficulty that arises in making a comparison between SIME/DIME and FDCH families is the definition of the variable or variables to be compared. The comparison might be made on total net worth of the family. However, that quantity included the values of many assets other than buildings and equipment, and the presence of these other assets can only blur any comparison between the two groups. At the other extreme, comparisons might be made on individual items of equipment or aspects of buildings. This approach too has difficulties. One problem is that some items may be missing from many observations, complicating the comparison. Also, this method multiplies the number of comparisons, making it difficult to reach a single conclusion unless the true difference is very pronounced. The variables actually chosen for the comparison represent a compromise between these two extremes. They are:

(1) The present value of all durable equipment in the home, excluding vehicles

(2) The present value of all land motor vehicles

(3) The number of rooms in the house, excluding bathrooms and hallways.

These variables were computed in the same way from the raw interview data for both groups.

---

*A paired comparison test was made for each variable. The value of the variable for a particular month was compared with the value for an earlier month for the same family. The number of months between the observations was the same as the number between the SIME or DIME observations and the FDCH observations.

The three variables listed above can reasonably be expected to be influenced by many other factors besides the home's use as a child care facility. In comparing family day care homes with the SIME and DIME families, it is important to eliminate or at least minimize the effect of these factors before the comparison is made. A straightforward way to do this involves the use of linear regressions. Regression models can be specified that explain the comparison (dependent) variables, including child care status. When these models have been estimated, values for the explanatory variables can be inserted to produce predictions. So long as reasonable values of the explanatory variables are used to calculate predictions, the differences between the predictions should reflect the true difference between family day care homes and SIME or DIME families.

This procedure was used to compare family day care homes with SIME and DIME families. Table E-1 lists the explanatory variables used in the models for each of the three comparison variables. Unfortunately, the list does not include some variables that seem likely to affect the comparison variables. Economic status as measured by family income and liquid assets should reasonably affect value of durables and value of vehicles. The number of rooms is also probably influenced by the number of children in the family. Data limitations prevented these and other possibly helpful explanatory variables from being included in the model. The absence of these variables may affect the comparison if there are systematic differences in the absent variables between the two populations.

The fact that there are three variables to be explained points to the use of multivariate regression for estimating the coefficients of the model. Multivariate regression is simply a generalization of the familiar regression model to the case in which there are several dependent variables. The technique produces the same estimates that would be produced by separate regressions on each dependent variable. However, in hypothesis tests, the multivariate technique makes use of the covariances between dependent variables that would implicitly be assumed to be zero if tests were done using separate, single dependent variable regressions.

Table E-1

CONTROL VARIABLES

1.	Location	0 Outside SIME or DIME area 1 Inside SIME or DIME area
2.	Education	Years of schooling
3.	Race	0 White 1 Black
4.	Age	Age of female head of family
5.	Parents Present	1 Family with one parent present 0 Family with two parents present
6.	Homeownership	0 Does not own home 1 Owns home

Models were estimated, with the dependent and independent variables described above, for family day care homes in each city, as well as for SIME and DIME families in each city. Then, predicted values of the comparison variables were calculated for each population, using mean values of the independent variables from the SIME population for the Seattle comparison and from the DIME population for the Denver comparison. Hypothesis tests were done for each, comparing the predicted values for SIME or DIME families against those for FDCH families. A simultaneous test for all three comparison variables was done first, and then a test for each comparison variable separately. The estimated models, the means of the explanatory variables, and results of the tests are presented in Tables E-2, E-3, E-4, E-5, and E-6. Tables E-2 and E-3 present regression coefficients for each group for each city. The means of independent variables used to calculate predicted values and the mean differences between the predicted values for the FDCH and SIME/DIME families are presented in Tables E-4 and E-5. The results of the tests of the differences between the groups are given in Table E-6.

Table E-2

REGRESSION COEFFICIENTS FOR SEATTLE

Independent Variables	SIME Dependent Variables: Value of Vehicles	Value of Durables	Number of Rooms
Education	65.7	8.9	-.020
Race	-116.0	-156.9	-.076
Age	-3.6	-5.9	-.006
Headship	-1141.0	-281.3	.178
Homeownership	367.7	214.0	.068
Constant	763.9	993.2	5.521

Independent Variables	Seattle FDCH Dependent Variables: Value of Vehicles	Value of Durables	Number of Rooms
Education	-10.4	-23.0	-.032
Race	15.4	43.5	.525
Age	7.5	-5.8	.004
Headship	-779.8	-252.3	-.413
Homeownership	582.8	667.5	.944
Location[a]	23.5	-14.5	.472
Constant	632.26	918.07	6.74

[a]The location variable is not used for the SIME regression because all families were within the area.

Table E-3

REGRESSION COEFFICIENTS FOR DENVER

Independent Variables	DIME Dependent Variables		
	Value of Vehicles	Value of Durables	Number of Rooms
Education	63.4	29.7	.086
Race	287.3	-14.8	.219
Age	-20.2	-10.9	.011
Headship	-466.2	-317.5	.160
Homeownership	281.6	622.8	.154
Constant	918.5	910.2	4.374

Independent Variables	Denver FDCH Dependent Variable		
	Value of Vehicles	Value of Durables	Number of Rooms
Education	94.4	76.4	.022
Race	-574.1	70.3	.293
Age	-12.1	-10.1	-.002
Headship	-761.7	-143.3	.487
Homeownership	1118.2	548.1	1.311
Location[a]	129.9	70.7	-.441
Constant	423.8	85.32	5.81

[a]The location variable is not used for the SIME regression because all families were within the area.

Table E-4

MEANS OF INDEPENDENT VARIABLES

	Seattle	Denver
Education	12.1	11.6
Race	.77	.74
Age	41.3	42.9
Headship	.44	.40
Homeownership	.17	.14
Location	1[a]	1[a]

[a]Comparison was made within the SIME and DIME areas.

Table E-5

PREDICTED DIFFERENCES

	FDCH/SIME	FDCH/DIME
Value of vehicles	-388.3	-514.9
Value of durables	-216.5	-135.3
Number of rooms	1.775	1.110

Table E-6

TEST RESULTS, SEATTLE AND DENVER

	SEATTLE	DENVER
Test 1: Comparison among SIME, DIME, and FDCH families on all three dependent variables		
Test statistic:	8.184	8.367
Degrees of freedom:	3,229	3,224
Significance:	<0.005	<0.005
	(Highly significant)	(Highly significant)
Test 2: Comparison on value of vehicles		
Test statistic:	2.071	4.903
Degrees of freedom:	1,231	1,226
Significance:	>0.1	<0.05
	(Not significant)	(Significant)
Test 3: Comparison on value of durables		
Test statistic:	3.047	.834
Degrees of freedom:	1,231	1,226
Significance:	>0.05	>0.1
	(Not significant)	(Not significant)
Test 4: Comparison on number of rooms		
Test statistic:	18.341	13.511
Degrees of freedom:	1,231	1,226
Significance:	<0.005	<0.005
	(Highly significant)	(Highly significant)

The differences in the predicted values of the comparison variables between SIME/DIME and FDCH families are consistent for Seattle and Denver. In both cities, the predicted value of vehicles and value of durables are less for family day care homes while the predicted number of rooms is greater. For both, the difference in the number of rooms is the most significant difference between SIME/DIME and family day care homes. The only real difference between the cities is that the difference in value of vehicles is significant in Denver and not in Seattle.

The results strongly support the conclusion that family day care homes have more rooms on the average than similar homes that do not provide child care. The direction of the difference is reversed for the other two comparison variables, but this may reflect differences in the data rather than differences between the two groups. While the data were responses to identical questions, they represent the first administration of the questionnaire to the FDCH families, while the SIME and DIME families had been asked the same questions several times before. This difference could be expected to lead to differences in reporting accuracy, especially since information collected in previous administrations of the questionnaires was used to prompt the SIME and DIME families. This difference in procedure must bias the predicted values for durables and vehicles upward for SIME and DIME families, relative to that for the FDCH families. Such a bias seems the best explanation for the higher values of durables and vehicles exhibited by SIME and DIME families. If there is some extra quantity of durables or vehicles needed for the operation of a family day care home, it is obscured by the bias caused by the different administration of the tests.

Appendix F

SUPPLEMENTARY INFORMATION FOR THE DERIVATION OF FUNCTIONS USED IN THE ESTIMATION OF THE COST OF CUSTODIAL CARE

Quality in Day Care

Quality of day care service is something researchers have had great difficulty defining and measuring. There is no agreement on what would constitute a measure or set of measures of day care quality. However, there is a typology, with which most researchers would agree, that has implications for the construction of a model for day care costs. This typology divides day care quality into two groups of attributes. One group has to do with the interaction of child and provider, and the environment or atmosphere of the place where the child receives care. High quality care is equated with a "warm nurturing atmosphere" and a provider who is attentive and takes an affirmative and encouraging attitude toward the child. This group of attributes measures quality more in terms of the determinants of the child's feelings about the experience than in terms of the effect of the experience upon his growth or development. Of course, the child's attitudes toward a place where he must spend much of his time inevitably affect his development. The distinction is made to contrast this bundle of attributes from another bundle that also affects child development and that involves the deliberate manipulation of the child's experience to bring about some specific change in his development. The only easily quantifiable indicator of quality of the first type is the staff/child or child/provider ratio. Most studies that have addressed the issue of day care quality have concluded that the staff/child ratio is crucial to the quality of care. The relationship between the staff/child ratio and day care cost is clear. Because labor is the most important element in child care services higher staff/child ratios must significantly increase costs. Some qualifications would be needed to apply this statement if staff/child ratios

and costs were to be compared between sectors of the day care market. However, it does hold within any one of the sectors. Moreover, this statement is not in contradiction to the view expressed by one reviewer that staff/child ratios, levels of professionalism, costs, and child behavior are inextricably convected.

The behavior of providers towards children is equally important but much more difficult to evaluate. Fortunately, only observable differences in provider behavior should have strong effects upon costs. While education and experience are easily evaluated, judgments of the provider's attitude must be so subjective and opinions of desirable provider behavior so various that the market could not accurately differentiate prices on the basis of this aspect of day care quality. Variation in the staff/child ratio and observable provider characteristics should summarize the effect of the first bundle of quality attributes upon day care cost.

The second aspect of day care quality in this typology involves the activities in the day care home or center that are designed to directly affect child development. This aspect might be called the quality of the day care program. Deliberate attempts at affecting the child's development range from simply a careful choice of the toys with which he may play through the establishment of a detailed and specific curriculum. This group of attributes is somewhat easier to quantify, at least approximately. The Westinghouse-Westat study [27], for example, classifies providers as giving either custodial, educational, or developmental care. Although measures of this group of attributes can be more explicit, there is less agreement above the level of quality associated with different types of developmental care. The different types of care are expressions of different theories of child development. In terms of its own theory, each particular type of care is best, but no generally accepted judgment of program quality exists.

Several indicators of the quality of day care vis-a-vis the child development activities pursued by the provider can be identified. The education and experience of the providers and the type of activities provided are examples of such indicators. Taken together, they represent

only a general understanding of the nature of this aspect of quality in day care service. The exact relationship between the indicators and the quality of day care is unknown, and a cost function incorporating indicators of the quality of the service will not directly relate cost and the quality of care. It follows that a cost function including quality indicators cannot be used to estimate the cost of a given quality of care unless that quality can be defined in terms of the indicator variables.

In general, it is not easy to relate day care quality to particular levels of the indicator variables. However, care that is almost purely custodial in nature should be identifiable because it would correspond to a minimum level of each of the variables identified as indicators of quality. Thus, a cost function incorporating the indicators of quality in day care service will permit the estimation of the cost of custodial care. This cost is an appropriate variable for the determination of day care policy, so informed decisions can be made without a complete understanding of quality variations in the provision of day care services.

While the cost of custodial care can be estimated from a function incorporating indicators, little insight will be gained into the nature of day care quality. Developmental care in general has a higher cost, but some types of developmental care may be costless or even lead to decreases in cost. Thus, the cost function will identify not the cost of purely custodial quality care, but the quality of care with the lowest cost. Since the estimates are to be used to determine the rate at which day care should be subsidized, this is not a serious drawback. Deviations from pure custodial care that were costless or resulted in cost savings could be included in subsidized care.

Even for those elements of quality that increase costs, the cost function is likely to provide little insight. The variables available to account for quality are only indicators: while they are known to be correlated with quality, their exact relationship to quality and their interrelationships with each other are unknown. It is likely, however,

that variables used as indicators of quality are highly intercorrelated. Variables indicating labor quality, age, experience, education, and race, for example, will be interrelated in ways other than in their mutual relationship to the cost of day care. Such interrelationships will cause the coefficients of variables used as indicators of quality to be inaccurately estimated. However, it is the relationship among these variables and not their joint effect upon day care cost that is inaccurately estimated. Again, our inability to accurately define quality will not detract from our estimates of the cost of custodial care. However, the intercorrelations of quality indicators will severely limit the information about the quality of day care obtainable from cost function estimates.

Nonlabor Inputs to Day Care Services

While labor is the most important input to day care services, it need not be the only one. For in-home providers, those who care for children in the children's own home, the children or their parents should normally provide whatever other inputs are used. The cost of these inputs should therefore not figure in the charge for day care. Another group of providers, the family day care home operators, bring children into their own homes and presumably supply nearly all inputs to the production of day care services. However, most of the inputs, besides labor, used in the production of day care are the services of various pieces of capital equipment, which the family of the provider also consumes directly. The accepted view of these inputs is that they represent the excess of capital services not consumed by the provider's family and as such do not represent a cost of day care. For this reason, and because it would be very difficult to identify the part of these capital services used in day care, we have ignored these inputs in the estimation of the cost of day care for family day care homes. However, an attempt was made to identify differences between the capital goods held by family day care homes and similar homes that do not provide child care. The results of this analysis are presented in Appendix E.

The contribution of other inputs to cost in day care centers cannot be ignored since these inputs are used exclusively for the production of day care services. Detailed information about the value and type of capital used in day care centers was collected in the interview. For analysis, it was necessary to aggregate the variables into a manageable set. The aggregation was done in value terms and the result was a single variable that measures the value of all capital equipment used in day care except buildings and grounds. Including a measure of the contribution of buildings and grounds proved difficult because the appropriate data were not often provided by the day care center. Two measures were investigated: square feet of floorspace and building cost, either rent or mortgage payment.

Other Services Provided With Day Care

Other services are often provided concurrently with day care and their price included in the day care charge. Variables were added to functions for each mode of care to account for these services. In-home providers sometimes provided various housekeeping services while they cared for children, and variables were added to account for the cost of these extra services. Both in-home and family day care home providers occasionally kept children with them overnight. Presumably the hourly charge for an overnight stay was much lower since it required little labor from the provider. Since our charge variable is standardized for 40 hours of any type of care, some adjustment for overnight stays was necessary. The adjustment was made by adding a variable that counted the number of overnight stays made by the child in the week of observation.

Combining Provider Types

While it differs in detail, the day care service is basically very similar for all providers. This implies that cost functions for different provider types should be similar. The similarity should also extend across

cities. In the estimation of cost functions, this similarity can be used to advantage. So long as the few differences between provider types and cities are accounted for within the equation, the data can be combined in estimating cost functions. Combining the data for different provider types will produce more precise estimates than could be obtained if cost functions for each provider type and city were estimated separately. However, the way in which the data should be combined and the variation across providers that should allowed in a combined regression are not obvious from prior knowledge of the day care service. Fortunately there is a flexible statistical test, the Chow test, that facilitates comparison between separate and combined models and between different forms of the combined model. Because of our belief in the similarity of the cost functions for different provider types, we imposed a 1% significance level for rejecting tests of combined regressions in favor of separate regressions.

Heteroskedasticity

The model, as described so far, can be expressed in the equation

$$C = \frac{a}{R} + b + c\,\frac{PCT}{R} + \Sigma d_i\,\frac{X_i}{R} + \varepsilon$$

The question of heteroskedasticity naturally arises here: there is no particular reason to suppose that C, the cost per child, has a constant variance for all providers. It seems just as reasonable that it is CR, the equivalent wage, and not C that has a constant variance for all providers. To find the correct form for the regressions presented below, we ordered their residuals by increasing the value of R and then plotted them. If the model estimated were heteroskedastic, the residuals would vary in absolute value systematically with R. Ordering the residuals by R assures that any systematic relationship will be readily apparent. This procedure was followed for the regressions presented below and in each case the model that showed no heteroskedastic relationship with R was chosen.

Cost Equations for In-Home and Family Day Care Home Providers

Our survey of in-home and family day care home providers produced information on each child who received care. These data for both provider types and cities were combined to estimate cost functions. Some variables were allowed to vary across provider types and cities. The variables chosen and the rationale for their choice is discussed below. The test of the hypothesis that these regressions could be combined had a significance level of 2.5%, outside the 1% level we had established for rejecting the hypothesis.

The model given in Equation (4) of Part V was estimated except that the dependent and independent variables were all multiplied by the child/provider ratio (R) to remove heteroskedasticity. The complete regression is displayed in Table F-1 and is followed by definitions of the regression variables. Table 27 of Part V breaks the regression into six cost equations, one for each provider type and city combination.

Four variables were allowed to vary between cities and provider types. The constant and the ratio of the average number of children in attendance to the maximum number were allowed to vary for each city and provider-type combination. The race variables were allowed to vary between cities only and the Chicano dummy for Seattle was suppressed because of the small number of Chicano providers. The child/provider ratio was allowed to vary across provider types only. These variables were chosen to vary because they seemed the most important in explaining day care costs and the most likely to affect costs differently for different provider types or in different cities. The relationship between the ratio of children per provider and the cost of day care is the basis for the model and is likely to vary across provider type and city. This indicated that both that ratio and the ratio of average to maximum attendance should be allowed to vary. Subsequently, it was discovered that there was very little variation across cities in the coefficient of the child/provider ratio so it was varied only across provider types. In the model, the constant represents a fixed charge for the provider's time, which is shared by each of the children. As such, it is an important part of the model and is likely to vary across provider types and

Table F-1

COMBINED IN-HOME AND FAMILY DAY CARE HOME REGRESSION
DEPENDENT VARIABLE: CR

Independent Variables	Coefficient (dollars)	Standard Error (dollars)
Constant	$105.01	$31.43
SEAIH	-40.98	40.84
SEAHU	-46.72	35.97
SEAHL	-56.30	31.46
DENHU	-72.00[a]	34.19
DENHL	-73.55[a]	31.69
RIH	5.19	5.04
RHU	13.24[a]	1.56
RHL	20.98[a]	0.68
SPCTCIH	-0.57	0.34
SPCTCHU	-0.48[a]	0.21
SPCTCHL	-0.69[a]	0.07
DPCTCIH	-1.02[a]	0.31
DPCTCHU	-0.29[a]	0.14
DPCTCHL	-0.59[a]	0.09
EDUC	1.32[a]	0.66
EXPER	0.03	0.28
PREWORK	-8.23[a]	3.84
INHOME	-4.81	3.22
HOME	1.38	12.75
CENTER	-13.25[a]	4.92
PCTDEVL	0.06	0.09
SBL	22.21[a]	4.69
DBL	-9.51	5.22
DCH	2.12	6.36
COOK	-3.13	14.81
LAUND	19.41	13.63
OVRNT	-7.46	3.25

Number of observations: 1750

R^2: 0.56

Standard error: 56.25

[a]Significantly different from zero at the 5% level.

DEFINITIONS OF REGRESSION VARIABLES
FROM TABLE F-1

Variable	Definition
C	Charge for a 40-hour week of care
R	Child/provider ratio
SEAIH	Dummy for Seattle in-home providers
SEAHU	Dummy for Seattle unlicensed family day care homes
SEAHL	Dummy for Seattle licensed family day care homes
DENHU	Dummy for Denver unlicensed family day care homes
DENHL	Dummy for Denver licensed family day care homes
RIH	Child/provider ratio for in-home providers
RHU	Child/provider ratio for unlicensed family day care homes
RHL	Child/provider ratio for licensed family day care homes
SPTCIH	Ratio of average to maximum attendance for Seattle in-home providers, expressed as a percent
SPCTCHU	Ratio of average to maximum attendance for Seattle unlicensed family day care homes, expressed as a percent
SPCTCHL	Ratio of average to maximum attendance for Seattle licensed family day care homes, expressed as a percent
DPCTCIH	Ratio of average to maximum attendance for Denver in-home providers, expressed as a percent
DPCTCHU	Ratio of average to maximum attendance for Denver unlicensed family day care homes, expressed as a percent
DPCTCHL	Ratio of average to maximum attendance for Denver licensed family day care homes, expressed as a percent
EDUC	Provider's years of education
EXPER	Provider's years of experience
PREWORK	Dummy indicating whether provider has ever held another full-time job
INHOME	Dummy for family day care homes only, indicating whether provider has ever been an in-home provider
HOME	Dummy for in-home providers only, indicating whether provider has ever worked in a family day care home
CENTER	Dummy indicating whether provider has ever worked in a day care center
PCTDEVL	Percent of care consisting of developmental activities
SBL	Dummy indicating a black provider in Seattle
DBL	Dummy indicating a black provider in Denver
DCH	Dummy indicating a Chicano provider in Denver
COOK	Dummy for in-home providers only, indicating that they cooked meals in addition to caring for children
LAUND	Dummy for in-home providers only, indicating they did laundry in addition to caring for children
OVRNT	Number of times the child stayed overnight with provider

cities. If the race of the provider affected his charges, the effect should differ only between cities. Any race effect should be similar for all provider types in a city, so race dummies were allowed to vary across cities only.

The parameters that varied across provider type or city are most conveniently discussed before the functions are separated. Some of these were included to account for charges other than regular child care. A variable was included counting the number of times the child stayed with the provider overnight for all types and cities. The sum of all hours spent with the provider was used to calculate a standard 40-hour charge and, if some of those hours represented overnight stays, the charge would be a weighted average of the charge for regular care and the charge for overnight care, with the weight depending upon the number of overnight stays. We have hypothesized that overnight care was cheaper per hour than regular care and this implies that the coefficient for OVRNT, the variable representing the number of overnight stays, should be negative. The regression confirms this hypothesis. The coefficient for OVRNT is significantly negative and is of appropriate size. Remembering that the dependent variable is the product of the charge per child and the child/provider ratio, we see that a provider with three children will charge approximately $2.50 less for 40 hours of care for each overnight stay included in that 40 hour period.

Dummy variables indicated whether in-home providers cooked or did laundry while they provided child care. Neither variable was significantly different from zero. While there must have been some additional charge for these services, there were too few providers performing them for the charge to be measured accurately.

Seven variables were included in the regression to capture the effect of quality differences upon the cost of day care. In general, these variables exhibit the behavior hypothesized above. They are co-linear and as a result have large standard errors and erratic values. Four out of the seven are not significantly different from zero at the 5% level. The variables are constructed such that larger values should

have a positive effect upon costs, yet three of them have negative coefficients, two of which are significantly different from zero. For one of these, the dummy indicating whether the provider has ever held a full-time job, the negative coefficient may not be so surprising. If the provider has never had a full time job, this may indicate he has a high reservation wage relative to others with his skill and training. He will work only if he receives a higher wage than is normally paid to persons with the same qualifications. That such persons exist and that lack of previous work experience would indicate them seems reasonable, but that anyone would make use of their services is somewhat surprising. Other, equally qualified, persons offer their services at a lower price, so competition should assure that only those asking lower wages would be employed. The reason we see such persons employed may be that they possess qualities especially attractive to their employer but not generally available in the market for child care providers. For example, the provider may live nearby or be related to the children and thus offer greater convenience or security to the parents. Such circumstances offer a plausible explanation for the negative coefficient on the previous-employment dummy.*

The negative coefficient on the dummy variable indicating whether the provider had ever worked in a day care center was also significantly less than zero. No explanation for this result is apparent. However, the decrease caused by the variable in the charge per child for an average number of children per provider is not large.

Three continuous variables were included to measure quality differences. Years of schooling had a significant effect upon the cost of care, increasing the charge about 43¢ per week for each year of education when a provider cares for three children. Surprisingly, neither the provider's experience nor the proportion of the children's time occupied in developmental activities had a significant effect upon the cost of

---

*Alternately, as a reviewer points out, the variable may indicate persons who have specialized in child care, and whose services are therefore more valuable as a day care provider.

care, so that these variables may not be good indicators of quality differences. A variable measuring the provider's age was used in preliminary regressions but it was found to be insignificant and highly colinear with other variables, so it was dropped.

Racial variables were varied only across cities, and, because of the small number of Chicanos in Seattle, the variable representing Seattle Chicanos was dropped. Neither of the racial dummies for Denver was significantly different from zero, indicating no strong support for the hypothesis that racial discrimination was present. The dummy for Seattle blacks strongly indicates racial discrimination, but in reverse. Black providers received significantly more money for their services than did Whites. The negative coefficient might have resulted from a spurious correlation between the dummy for Black providers in Seattle and a variable affecting cost that was excluded from the regression. For example, race might be correlated with the location of the provider in the city, and the areas in which Black providers tend to work might have higher-than-average charges. This possibility and several other plausible correlations have been investigated without result. The coefficient for Black providers in Seattle remains unexplained.

Day Care Centers

The survey used to collect data from day care centers differed from that used for the in-home providers and family day care homes in several respects. Because of the size of the centers, data were not collected on individual children. Although data were collected for individual providers, that information was useful only in the aggregate because the provider information could not be related to individual children. The center survey provided essentially a single observation for each center, representing average values for the dependent and independent variables. Although all centers in both cities were surveyed, only 87 center interviews provided enough data to estimate a cost function. Even some of these were incomplete, but the missing variables were not vital and were therefore replaced with means from the complete observations. The form of the interview required us to calculate the charge for a 40-hour week

of care in a special way. The interview did not ask for charges for individual children but rather for a charge schedule. The blank schedule in the interview allowed the charge to vary by the number of children per family and by the family income. We produced a single average charge from this schedule in two steps. First, for each category of number of children per family, we took a weighted average across income strata. The weights were based upon the proportion of families in each strata for each city, as reported in the 1970 Census. The next step was to average across the number of children per family, and the weights used were the proportions of families with that number of children in the two cities, also taken from the 1970 Census. The charge thus derived was then adjusted to a charge per 40-hour week. This procedure was the best way to produce a variable comparable to that used for other providers. However, it relies on several assumptions that could have been violated for many centers. This problem, together with the relatively small number of observations for centers, make the results presented below somewhat less reliable than those for other providers.

The charge variable derived as described above is a mean charge for all children in the center. We assume for the centers as well as for the family day care home and in-home providers that the charge for each child has an identical variance. The mean charge for a particular center then has a variance inversely proportional to the number of children in the center. Regressions using the charge as a dependent variable must be corrected or the stochastic error will be heteroskedastic. The appropriate correction is to multiply the charge and all independent variables in the regression by the square root of the number of children at the center. Heteroskedasticity might also have resulted if the wrong form were chosen to estimate the regression. The form used in the regression for in-home providers and family day care homes was found to be inappropriate and the regression was run directly on the charge rather than on the equivalent wage.

There were several differences between the independent variables used in the center regression and those used in the in-home and family day care home regression. Dummies indicating whether providers had previously

held a full-time job or provided other types of day care could not be produced from the center interviews. Also, none of the extra services sometimes provided by in-home providers or family day care homes were furnished by centers, so the variable counting the number of times the child stayed overnight with the provider and the dummies indicating that the provider cooked or did laundry were dropped. An attempt was made to construct a variable corresponding to PCTCHLD in the in-home provider, family day care home regression. Because the center questionnaire had no information on individual children, the variable was constructed using the number of full- and part-time children with an imputed average attendance for part-time children. The variable had no predictive power in the preliminary regression and it was dropped.

Other variables specific to centers were added to the regression. The variable CAPITAL measured the market value of all capital equipment per child except building and grounds. Two proxies for facilities rental were tried, but neither contributed greatly to the regression. Poor quality of data may explain this result. Another variable was added to capture the effect upon cost of any direct subsidy to the center. The specific variable used was the amount of direct subsidy per child per week. Dummies were also added to account for cost differences by center type. There are both public and private day care centers and among private centers there are both profit-making and nonprofit centers. The fact that centers usually have several providers led us to use means for variables measuring their qualities. A mean age variable was tried for the centers. Although it was not useful in the in-home provider, family day care home regression, mean age proved to have some influence over cost for centers and it was retained in the final regression.

Attempts were made to combine the data for Seattle and Denver in the final center regression. Little difference was found between the regressions for the two cities. Therefore the data were combined and only the constant term was allowed to vary between the two cities. The F test of the constraints implied by that particular combined regression was barely significant at the 2.5% level, outside the 1% critical level we have previously set.

Cost Equations for Day Care Centers

The combined regression for Seattle and Denver was shown in Table 31 of Part V, along with a list of definitions. The most noticeable thing about that regression is the scarcity of variables significantly different from zero. Only EDUC and PROFIT were significantly different from zero at the 5% level. The general low significance level is probably explained by the combination of a relatively small sample size and limited variation in the levels of variables that determine day care cost. While the final sample size was 87, the standard error of the unweighted dependent variable--the charge per child--was only 4.69 across centers. The small variation in the dependent variable suggested that the independent variables might be relatively constant, and further examination confirmed that few of the independent variables exhibit great variations across centers.

The small sample size and limited variability of independent variables in the regression have led to high standard errors of the coefficient but the problem had not been so severe as to produce wild coefficient values. All the coefficients except those for average provider experience and the child provider ratio have the expected signs. The variable EXPER measures the average experience of all providers in the center. Experience is a desirable quality and should have a positive effect upon cost. However, the regression predicts that each year of provider experience decreases the charge per child by $.65. Similarly, the coefficient of R, the child/provider ratio, measures the fixed cost per provider, which must be divided among the children, and such a fixed charge is presumably positive. Neither coefficient is significantly different from zero at even the 10% level, and we conclude that the incorrect signs are a result of the variability of the parameter estimates caused by the small sample size and limited variation of the independent variables.

No other coefficients have signs different from what is to be expected and most have values in a range that seems reasonable. Two exceptions are the variables measuring capital per child and subsidy per child. The coefficient of the capital variable measures the charge per week

per dollar of capital. When compounded, the coefficient implies a yearly return on capital of 2.3%. The coefficient is unreasonably low but its large standard error indicates that it is very inaccurately measured. A two-standard-error interval around the estimated coefficient more than covers all reasonable values of the coefficient. The coefficient of the subsidy variable measures the decrease in the weekly charge caused by a one dollar increase in the direct subsidy per child. As mentioned above, the subsidy variable was based upon the previous year's subsidy, so conclusions about the effect of direct subsidies should be made cautiously. However, the interesting hypothesis for this coefficient is that the coefficient is one, implying a one-for-one trade-off between subsidy and charge, and this hypothesis can clearly be rejected. The estimated coefficient is more than ten standard errors away from one, so the hypothesis can be rejected despite the mismatching of the subsidy data. Direct subsidies do not seem to result in equivalent reductions in the charge per child.

The coefficients allow us to test other interesting hypotheses about the determinants of cost in day care centers. The coefficient of the dummy indicating a public center is nearly significant and the coefficient of the dummy indicating centers operated for profit is significant at the 5% level. There are three types of centers: private profit-making centers, private nonprofit centers, and public. The PROFIT and PUBLIC dummies represent the difference in these three types of centers and the significance of the coefficients indicates some differences between the charges of different types of centers. The significance or near significance of the tests PROFIT and PUBLIC against zero imply that private profit-making centers and public nonprofit centers are each different in cost from private nonprofit centers. The third hypothesis, that private profit-making centers were equal in cost to public nonprofit centers, was also tested and no significant difference in cost was found. Also, the coefficient of the variable indicating that a center was in Seattle was insignificant. This supports the hypothesis that there is little difference between the cost relationships for the two cities.

SELECTED REFERENCES

1. Abt Associates, Inc., "Costs and Quality Issues for Operators," from A Study in Child Care 1970-71, Vol. III (Boston, Mass., 1972).

2. Bain, J. S., Industrial Organization (J. Wiley & Sons, Inc., New York, New York, 1959).

3. Bourne, P. G., "What Day Care Ought to Be," The New Republic (Jan. 12, 1972).

4. Breiter, C., "An Academic Proposal for Disadvantaged Children: Conclusions from Evaluation Studies," paper presented at Johns Hopkins University, Feb. 1971).

5. Campbell, D., and A. Erlbacker, "How Regression Artifacts In Quasi-Experimental Evaluation Can Mistakenly Make Compensating Education Look Harmful," Disadvantaged Child, Vol. III, J. Helimuth, ed. (Brunner & Mazel, New York, New York, 1970).

6. Chambers, J., "An Analysis of School Size Under a Voucher System," Occasional Papers In the Economics & Politics of Education, No. 72-11, School of Education, Stanford University (Nov. 1972).

7. Child Care Bulletin No. 9, "Alternative Federal Day Care Strategies for the 1970's," Day Care and Child Development Council of America, Inc. (March, 1972).

8. Children's Bureau of the US DHEW, "Standard & Costs for Day Care," Day Care & Child Development Council of America (1968).

9. Fein, G. G., and A. Clarke-Stewart, Day Care in Context (J. Wiley & Sons, New York, New York, 1973).

10. Jencks, C., et al., Inequality: A Reassessment of the Effect of Family and Schooling in America (Basic Books, Inc., New York, New York, 1972).

11. Kurz, M., P. Robins, and R. G. Spiegelman, "A Study of the Demand for Child Care by Working Mothers," Research Memorandum 27, Center for the Study of Welfare Policy, Stanford Research Institute, Menlo Park, Calif. (August 1975).

12. Low, S., and P. G. Spindler, "Child Care Arrangements of Working Mothers in the U.S.," Children's Bureau Publication 461, 1968, US DHEW (1968).

13. Meyer, W. J., "Staffing Characteristics & Child Outcomes," paper prepared for DHEW, OS/ASPE/SSHD, Contract No. HEW-100-76-0145 (January 1977).

14. Moore, T. G., "The Purpose of Licensing," The Journal of Law & Economics, Vol. 4, pp. 93-117 (Oct. 1961).

15. Office of Child Development, "Day Care Licensing Study, Summary Report on Phase I: State and Local Day Care Licensing Requirements," US DHEW, Bureau of Child Development Services, Publication No. (OCO) 73-1066 (1973).

16. Rowe, M. P., and R. D. Husby, "Economics of Child Care: Costs, Need & Issues," in Child Care Who Cares? Pamela Roby, ed., Chap. 8 (Basic Books, New York, New York, 1973).

17. Rowe, R. R., et al., "Child Care in Massachusetts: The Public Responsibility," Massachusetts Early Education Project (Feb. 1972).

18. Ruderman, F. A., Child Care & Working Mother: A Study of Arrangements Made For Daytime Care of Children, Child Welfare League of America (1968).

19. Samuelson, P. A., "Parable and Realism in Capital Theory: The Surrogate Production Function," The Review of Economic Studies, Vol. XXIX(3), No. 80, pp. 193-206, June 1962.

20. Schultze, C. L., E. R. Fried, A. M. Rivlin, and N. H. Teeters, "Child Care," in Setting National Priorities: the 1973 Budget, Chap. 8, (Brookings Institution, Washington, D.C., 1972).

21. Stanford Research Institute, "A Survey of Day Care In Seattle and Denver," conducted during May, 1974, SRI, Menlo Park, Calif.

22. Stigler, G. J., "The Theory of Economic Regulation," The Bell Journal of Economics & Management Science, Vol. 2, No. 1, pp. 3-21 (1971).

23. Strober, M. H., "Some Thoughts on the Economics of Child Care Centers," Paper read at 140th meeting of the American Association for the Advancement of Science, February 28, 1974, San Francisco, Calif.

24. Unco, Inc., "A Profile of Federally Supported Day Care in Region X," Vol. 3 (Final Report), prepared for the US Dept. of HEW (Mar. 31, 1973).

25. Walters, A. A., "Production & Cost Functions: An Econometric Survey," Econometrica, Vol. 31, No. 1-2, pp. 1-66 (July-April, 1963).

26. Weiner, S., "The Cost of Compliance with Federal Day Care Standards in Seattle and Denver," Research Memorandum 40, Center for the Study of Welfare Policy, Stanford Research Institute, Menlo Park, Calif. (June 1977).

27. Westinghouse Learning Corp. and Westat Res., Inc., Day Care Survey--1970: Summary Report and Basic Analysis (April 1971).

28. Young, D. R., and R. R. Nelson, eds., Public Policy for Day Care of Young Children: Organization, Finance, & Planning (Lexington Books, Lexington, Mass., 1973).

CENTER FOR THE STUDY OF WELFARE POLICY
RESEARCH MEMORANDA*

The following Research Memoranda and Reprints are available upon written request to:

Center for the Study of Welfare Policy
SRI International
333 Ravenswood Avenue
Menlo Park, California 94025

Research Memorandum Number	Title and Authors
15	*The Assignment Model of the Seattle and Denver Income Maintenance Experiments*, J. Conlisk and M. Kurz, July 1972.
18	*The Design of the Seattle and Denver Income Maintenance Experiments*, M. Kurz and R. G. Spiegelman, May 1972.
19	*The Payment System for the Seattle and Denver Income Maintenance Experiments*, M. Kurz, R. G. Spiegelman, and J. A. Brewster, June 1973.
21	*The Experimental Horizon and the Rate of Time Preference for the Seattle and Denver Income Maintenance Experiments: A Preliminary Study*, M. Kurz, R. G. Spiegelman, and R. W. West, November 1973.
22	*Social Experimentation: A New Tool in Economic and Policy Research*, M. Kurz and R. G. Spiegelman, November 1973.
23	*Measurement of Unobservable Variables Describing Families*, N. B. Tuma, R. Cronkite, D. K. Miller, and M. Hannan, May 1974.
24	*A Cross Sectional Estimation of Labor Supply for Families in Denver 1970*, M. Kurz, P. Robins, R. G. Spiegelman, R. W. West, and H. Halsey, November 1974.
25	*Job Search: An Empirical Analysis of the Search Behavior of Low Income Workers*, H. E. Felder, May 1975.
26	*Measurement Errors in the Estimation of Home Value*, P. Robins and R. W. West, June 1975
27	*A Study of the Demand for Child Care by Working Mothers*, M. Kurz, P. Robins, and R. G. Spiegelman, August 1975.
28	*The Impact of Income Maintenance on the Making and Breaking of Marital Unions: Interim Report*, M. Hannan, N. B. Tuma, and L. P. Groeneveld, June 1976.
29	*The Estimation of Labor Supply Models Using Experimental Data: Evidence from the Seattle and Denver Income Maintenance Experiments*, M. C. Keeley, P. K. Robins, R. G. Spiegelman, and R. W. West, August 1976.

30 *Determinants and Changes in Normative Preferences of Spouses*, R. C. Cronkite, May 1977.

31 *Homogamy, Normative Consensus, and Marital Adjustment*, R. C. Cronkite, May 1977.

32 *The Determinants of Participation of Single-Headed Families in the AFDC Program*, Arden Hall, May 1977.

33 *The Supply of Day Care Services in Denver and Seattle*, Arden Hall and Sam Weiner, June 1977.

35 *First Dissolutions and Marriages: Impacts in 24 Months of the Seattle and Denver Income Maintenance Experiments*, N.B. Tuma, L.P. Groeneveld, and M.T. Hannan, August 1976.

36 *The Estimation of Nonlinear Labor Supply Functions with Taxes from a Truncated Sample*, Michael Hurd, November 1976.

37 *The Welfare Implications of the Unemployment Rate*, Michael Hurd, November 1976.

38 *The Labor Supply Effects and Costs of Alternative Negative Income Tax Programs: Evidence from the Seattle and Denver Income Maintenance Experiments, Part I: The Labor Supply Response Function*, M. C. Keeley, P. K. Robins, R. G. Spiegelman, and R. W. West, May 1977.

39 *The Labor Supply Effects and Costs of Alternative Negative Income Tax Programs: Evidence from the Seattle and Denver Income Maintenance Experiments, Part II: National Predictions Using the Labor Supply Response Function*, M. C. Keeley, P. K. Robins, R. G. Spiegelman, and R. W. West, May 1977.

40 *Cost of Compliance with Federal Day Care Standards in Seattle and Denver*, Sam Weiner, May 1977.

41 *An Interim Report on the Work Effort Effects and Costs of a Negative Income Tax Using Results of the Seattle and Denver Income Maintenance Experiments: A Summary*, M.C. Keeley, P.K. Robins, R.G. Spiegelman, and R.W. West, June 1977.

*Research Memoranda 1 through 14, 16, 17, and 20 are obsolete and are not available for distribution. Research Memorandum 34 is in preparation.

CENTER FOR THE STUDY OF WELFARE POLICY
REPRINT SERIES

M. Kurz and R. G. Spiegelman, "The Seattle Experiment: The Combined Effect of Income Maintenance and Manpower Investments," *American Economic Review* (May 1971).

Michael C. Keeley, "A Comment on an Interpretation of the Economic Theory of Fertility," *Journal of Economic Literature* (June 1975).

Takeshi Amemiya, "The Modified Second-Round Estimator in the General Qualitative Response Model," Technical Report No. 189, The Economics Series, Institute for Mathematical Studies in the Social Sciences, Stanford University, Stanford, Ca., December 1975.

R. G. Spiegelman and R. W. West, "Feasibility of a Social Experiment and Issues in Its Design: Experiences from the Seattle and Denver Income Maintenance Experiments," in *1976 Business and Economic Statistics Section Proceedings of the American Statistical Association.*

Takeshi Amemiya, "The Specification and Estimation of a Multivariate Logit Model," Technical Report No. 211, The Economics Series, Institute for Mathematical Studies in the Social Sciences, Stanford University, Stanford, Ca., June 1976.

Michael C. Keeley, "The Economics of Family Formation: An Investigation of the Age of First Marriage," *Economic Inquiry* (April 1977).

Philip K. Robins and Richard W. West, "Measurement Errors in the Estimation of Home Value," *Journal of the American Statistical Association* (June 1977)